WX2400-UM-251

73804-010
WX2400-UM-251
Service Manual

FOR REFERENCE USE ONLY
#QA0048

A4/X-Y RECORDER

WX2400 series

SERVICE MANUAL
AND PARTS LIST

GRAPHTEC CORP.
TOKYO, JAPAN

Table of Contents

		Page
1.	BLOCK DIAGRAM	1
2.	NAMES OR PARTS AND ADJUSTMENT TRIMMERS	2
2.1	Bottom View	2
2.2	Right Side View	2
2.3	Bottom Plate	3
3.	DISASSEMBLY AND REASSEMBLY	4
3.1	Removing the Upper Cover (Fig. 3-1)	4 (5)
3.2	X-Axis Wiring (Fig. 3-2)	4 (6)
3.3	Y-Axis Wiring (Fig. 3-3)	4 (7)
3.4	Mounting the Recording Paper Feed Mechanism (Fig. 3-4)	4 (8)
3.5	Removing the Recording Paper Feed Mechanism Cover (Fig. 3-5)	4 (9)
4.	ADJUSTMENTS	10
4.1	Wire Tension	10
4.2	Perpendicularity	13
4.3	Pen Pressure	14
4.4	Servo Amplifier Adjustments	15
4.5	Time Sweep	18
4.6	Preamplifier (Z)	20
5.	PARTS LIST	
5.1	Mainframe	5 - 1
5.2	X-Axis Servo Mechanism	5 - 4
5.3	Y-Axis Servo Mechanism (1-Pen Type)	5 - 8
5.4	Y-Axis Servo Mechanism (2-Pen Type)	5 - 12
5.5	Wiring Diagram, Power/Mother/Sub Board	5 - 16
5.6	Control Unit	5 - 24
5.7	Time Sweep Unit	5 - 28
5.8	Servo Amplifier	5 - 32
5.9	Preamplifier Type Z	5 - 38
5.10	Preamplifier Type L	5 - 44
5.11	Preamplifier Type E	5 - 46
5.12	Chart Drive Wiring Diagram	5 - 50
5.13	Chart Driver	5 - 52
6.	SPECIFICATIONS	58
6.1	Recorder Specifications	58
6.2	Time Sweep Specifications	59
6.3	Preamplifier Units	60

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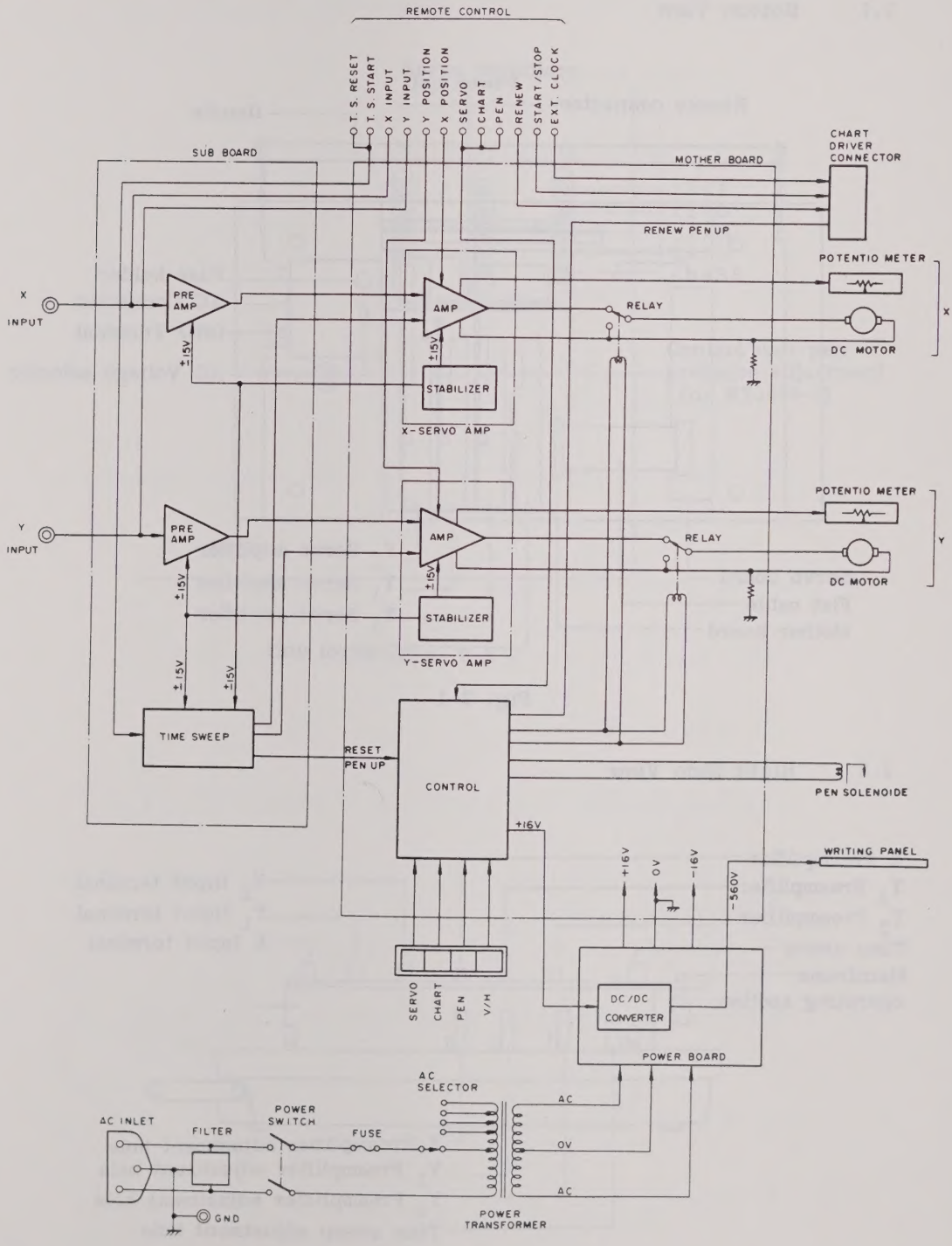
1. BLOCK DIAGRAM



2. NAMES OR PARTS AND ADJUSTMENT TRIMMERS

2.1 Bottom View

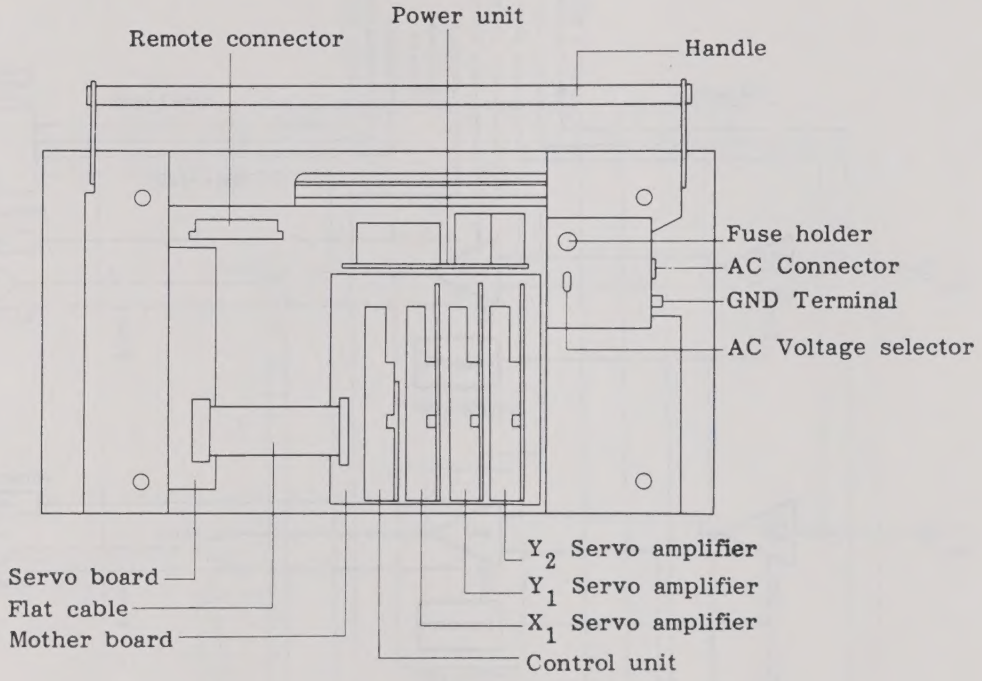


Fig. 2-1

2.2 Right Side View

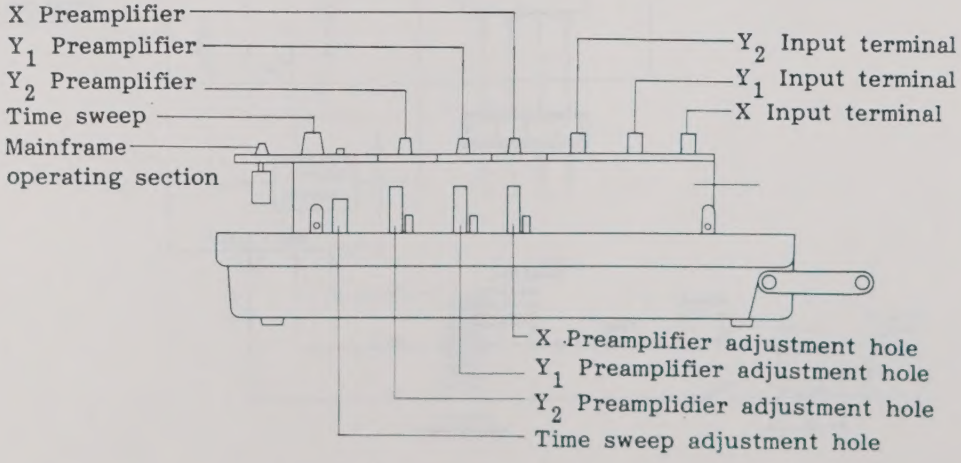


Fig. 2-2

2.3 Bottom Plate

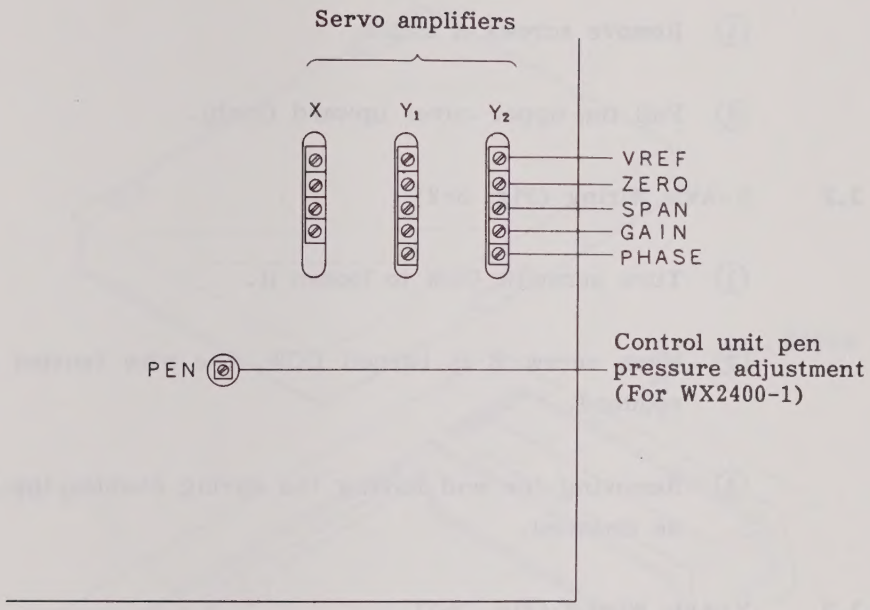


Fig. 2-3

3. DISASSEMBLY AND REASSEMBLY

3.1 Removing the Upper Cover (Fig. 3-1)

① Remove screws A and B.

② Pull the upper cover upward firmly.

3.2 X-Axis Wiring (Fig. 3-2)

① Turn screw A CCW to loosen it.

② When screw B is turned CCW, the wire tension will be reduced.

③ Removing the end having the spring enables the wire to be removed.

3.3 Y-Axis Wiring (Fig. 3-3)

① Turn screw A CCW to loosen the wire tension.

② Remove wire end A.

3.4 Mounting the Recording Paper Feed Mechanism (Fig. 3-4)

① The recording paper feed mechanism is mounted to the mainframe from the bottom using screw A and the mounting guide.

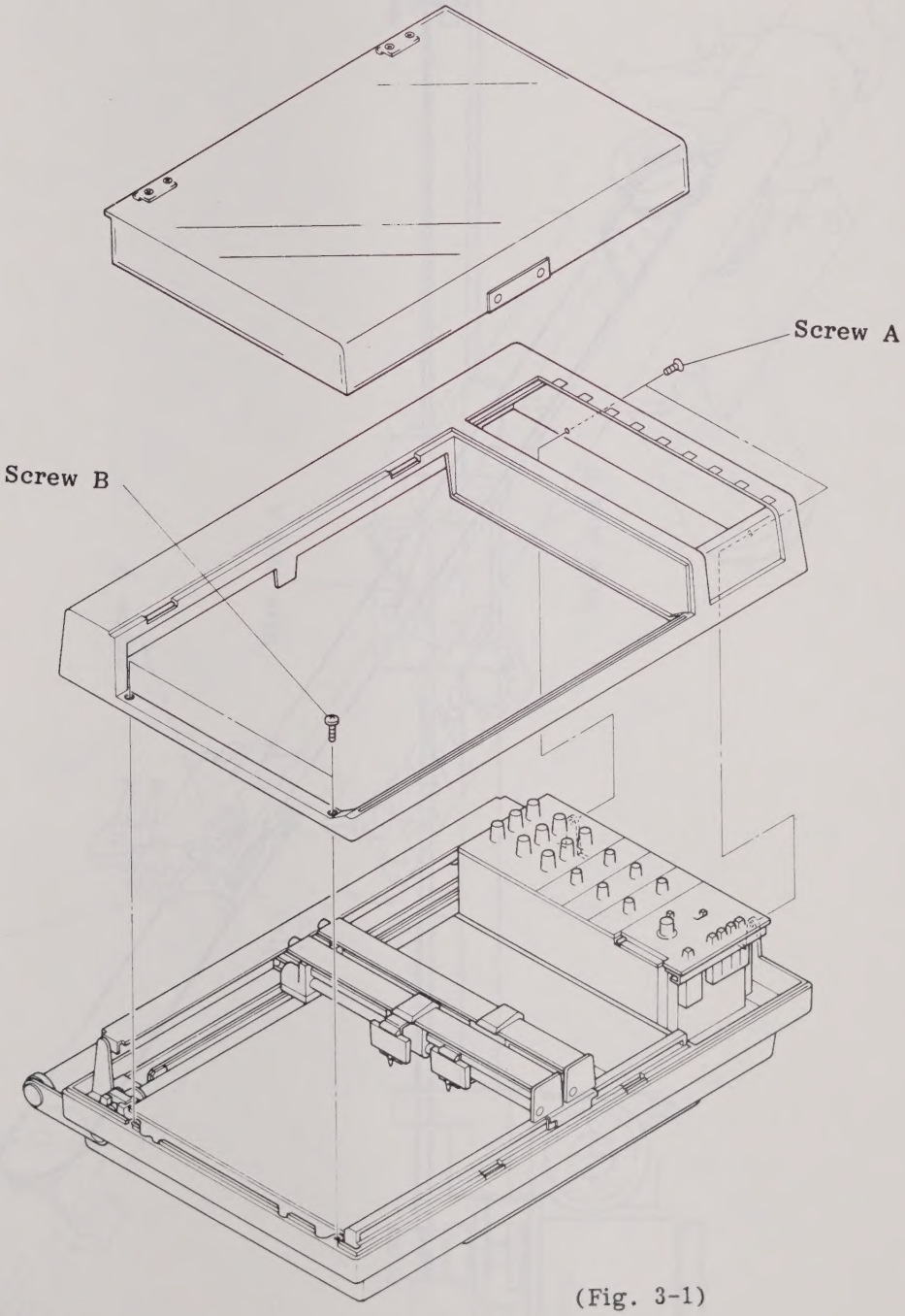
3.5 Removing the Recording Paper Feed Mechanism Cover (Fig. 3-5)

① Remove screw A and switch knobs.

② Pull the cover upward.

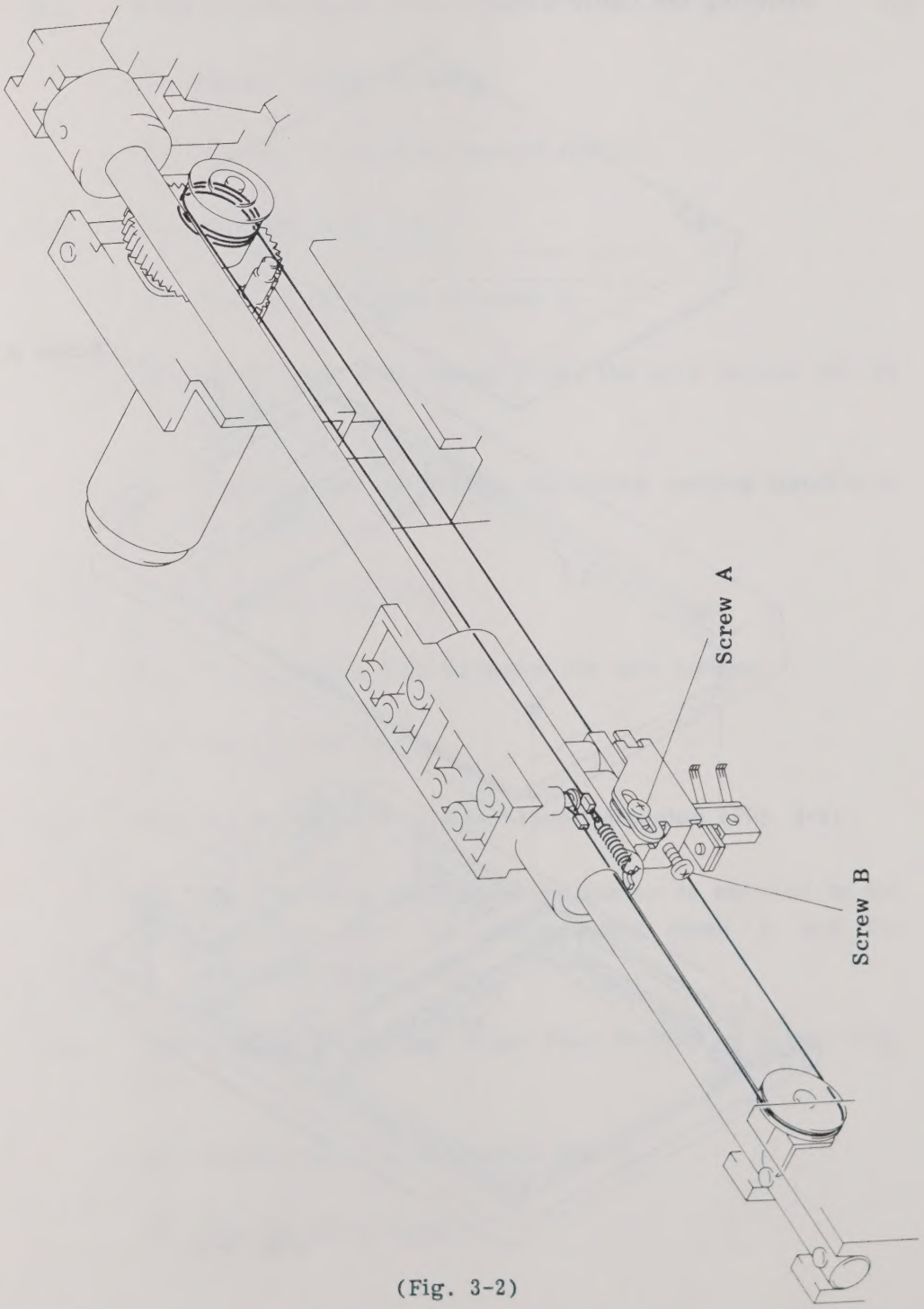
3. DISASSEMBLY AND REASSEMBLY

3.1 Removing the Upper Cover



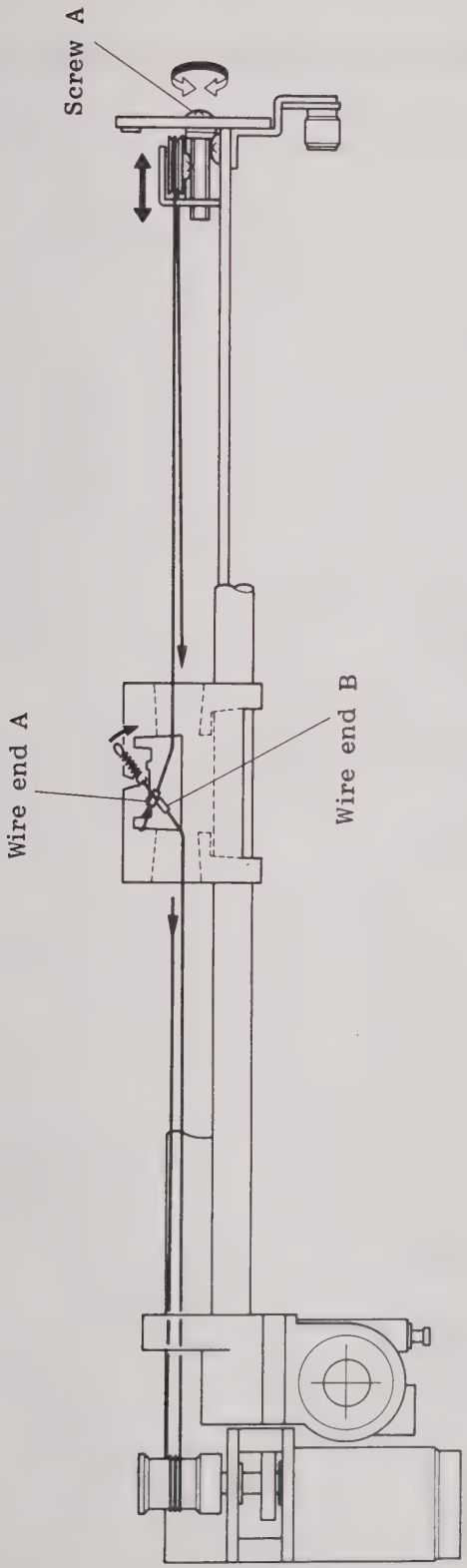
(Fig. 3-1)

3.2 X-Axis Wiring



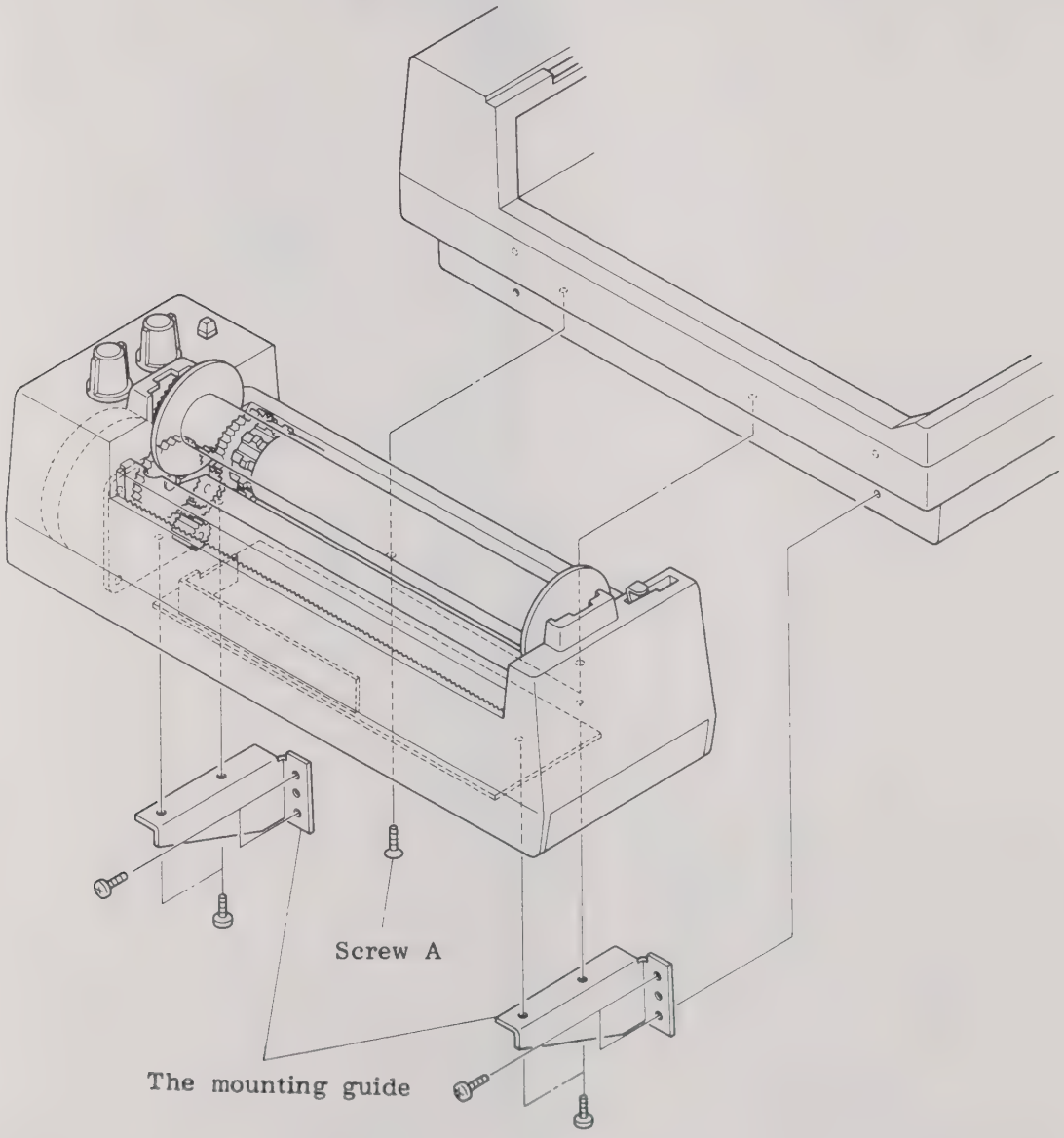
(Fig. 3-2)

3.3 Y-Axis Wiring



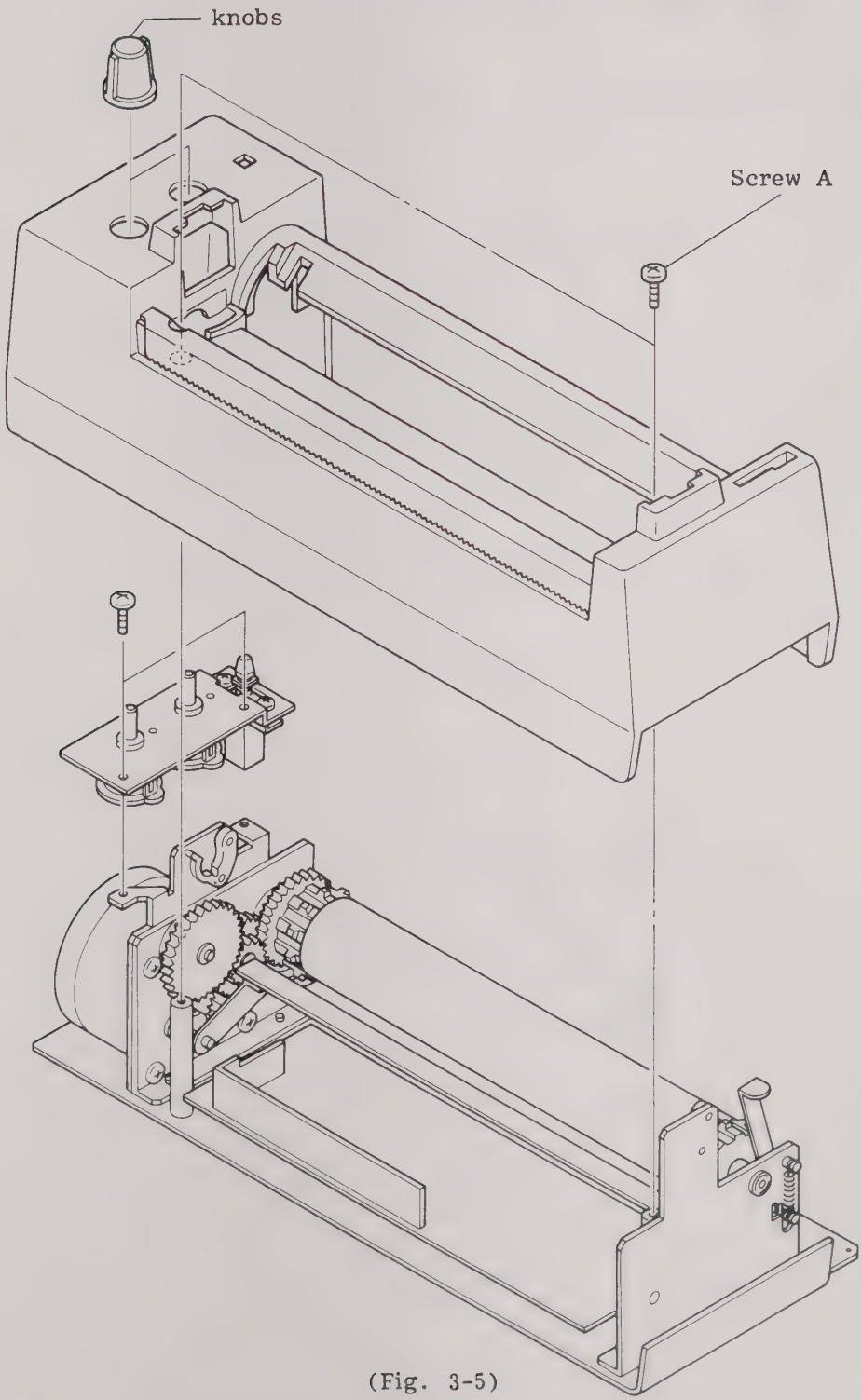
(Fig. 3-3)

3.4 Mounting the Recording Paper Feed Mechanism



(Fig. 3-4)

3.5 Removing the Recording Paper Feed Mechanism Cover



(Fig. 3-5)

4. ADJUSTMENTS

4.1 Wire Tension

4.1.1 X-Axis Tension

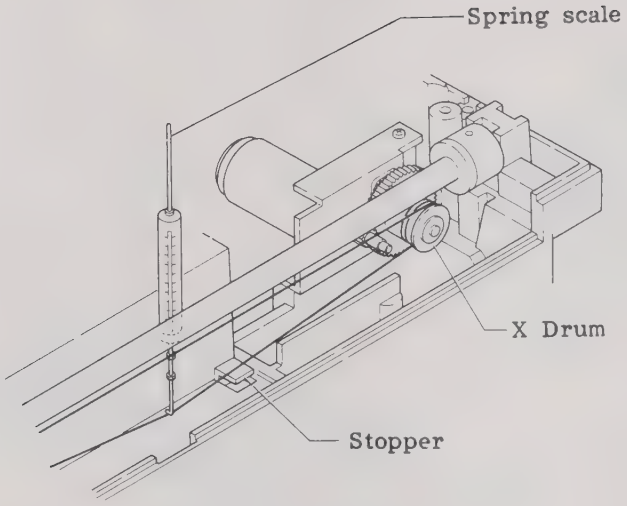


Fig. 4-1

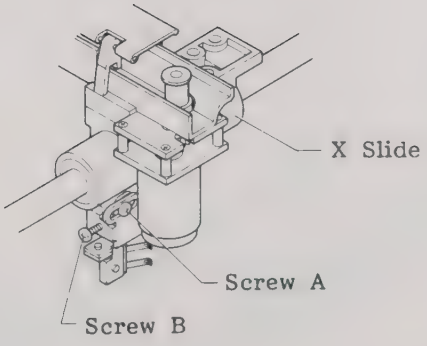


Fig. 4-2

① Remove the upper cover.

② Move the X slide to the right side (extreme + side).

③ With the X drum and X pulley roughly in the center position, press a spring scale onto the wire as shown in Fig. 4-1.

With 4mm deflection, the tension should be 90 ∿ 110g.
With 4mm deflection, the wire will touch the stopper.

④ If the wire tension is not correct, loosen the X slide screw A and turn the screw B CW to increase the tension. After tension adjustment is completed, tighten screw A so that the tension does not change (see Fig. 4-2).

The tension should be measured after moving the X slide back and forth several times to stabilize it.

4.1.2 Y-Axis Tension

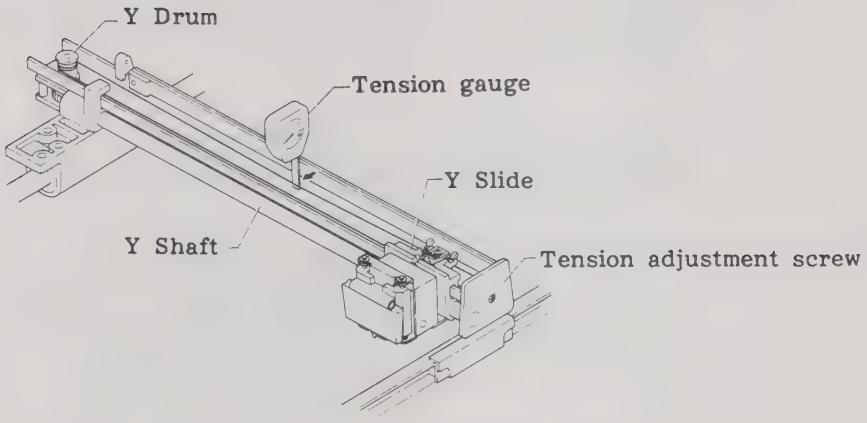


Fig. 4-3

① Remove the upper cover.

② Remove the Y sliding section scale plate.

③ Move the Y slide forward (i.e., to the - direction).

④ With the Y drum and Y pulley in the approximate center position, press a tension gauge onto the wire as shown in Fig. 4-3.

With 3mm deflection, the tension should be 22 ∿ 26g.

⑤ If the wire tension is not correct, adjust using the tension adjustment screw. Turning the screw CW increases tension.

Tension measurement should be made after moving the Y slide back and forth several times to stabilize it.

4.2 Perpendicularity

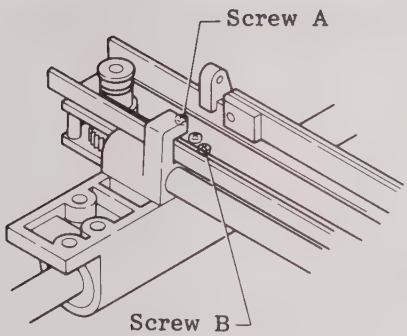


Fig. 4-4

① Remove the upper cover.

② Remove the Y sliding section scale plate.

③ Using the X-axis recorded line as a reference, loosen screws A and B as shown in Fig. 4-4 to fine adjust the Y-axis angle so that the Y axis recorded line is perpendicular to the X axis recorded line.

④ After adjustment, tighten screws A and B securely. Note that these screws are provided with star-type lock washers.

4.3 Pen Pressure

The pen lift mechanism of the 1-pen type recorder (WX2400-1) differs from that of 2-pen recorders (WX2400-2).

In the 2-pen type, spring force applies pen pressure, so that electrical adjustment is not possible.

In contrast to this, the 1-pen type, solenoid pull-in force applies pressure to the pen, so that the adjustment described below is possible for 1-pen type recorders.

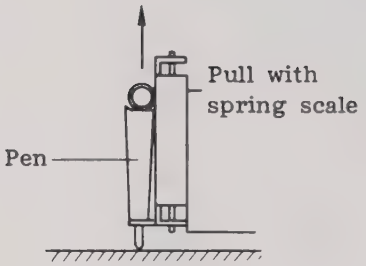


Fig. 4-5

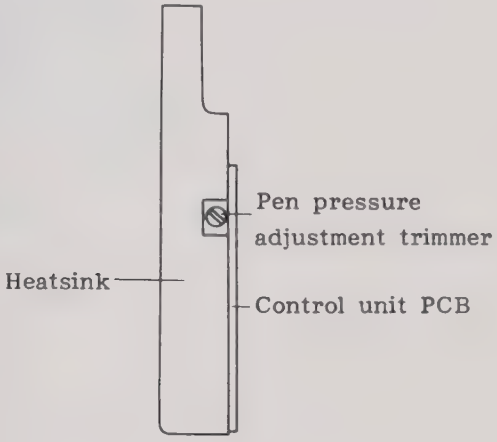


Fig. 4-6

① Set the mainframe attitude to the vertical position.

② Press the mainframe operating panel V/H switch to select VERT.

③ Adjust the pen pressure adjustment trimmer at the bottom of the mainframe so that the pen pressure (when down) is 24 ±4g (refer to Fig. 2-3 and 4-6).

④ With the mainframe in a horizontal attitude, use the V/H switch to select HORI and verify that the pen pressure is 24 ±4g.

4.4 Servo Amplifier Adjustments

These adjustments are made with the preamplifier removed, and a preamplifier short PCB inserted in place of the preamplifier. Note, however, that the PHASE adjustment is easier to make with the preamplifier inserted.

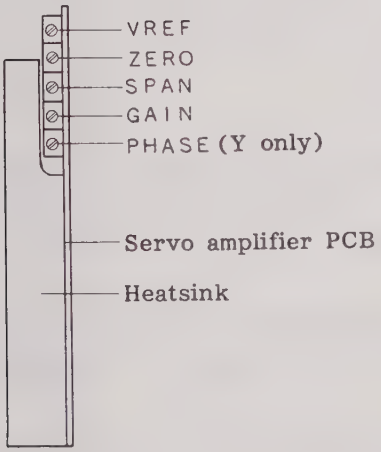


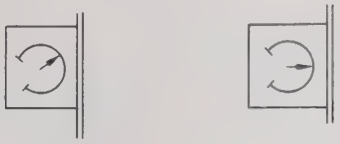
Fig. 4-7

V_{REF} (R4)

① Adjust the V_{REF} trimmer so that the servo amplifier board internal jumpers J1 (+15V) and J2 (-15V) are at voltages +15V±0.2% and -15V±0.2%, respectively. Rotating CW increases the voltage. The ±15V measurement may be made at the mother board connector or preamplifier connector as well.

ZERO (R31)

② Preadjust the GAIN trimmers to the positions shown below.



(X) (Y)

③ Mount recording paper and, with an input voltage of 0V, adjust the ZERO trimmer so that the pen is in the center of the recording paper scale.

SPAN (R22)

④ Apply an input voltage and adjust the SPAN trimmer so that the pen deflects to fullscale. Rotating CW widens the span.

X: ±2.5V for ∓125mm
Y: ±1.8V for ∓90mm
} 0.2V/cm sensitivity

For positive input voltages, the pen deflects to the minus side.

⑤ Increase the input voltage and verify that the electronic limits operate.

GAIN (R25)

⑥ Verify that the deadband is within ±0.1% (0.2%p-p) of fullscale.

X: $\pm$0.5mm
Y: $\pm$0.36mm

If the deadband is outside these limits, adjust the GAIN trimmer(s) clockwise to increase the gain.

Readjustment will be necessary after this procedure, since the zero point and span will change slightly.

CAUTION

- When the GAIN is changed, readjustment is necessary, as the zero point and span will change somewhat.
- Note that while changing the ZERO does not change the gain or span, it does shift the electronic limits.
- Changing the SPAN changes either the zero point or gain.

PHASE (R21)

⑦ Mount the preamplifier. (Set the filter characteristics at -20dB.)

⑧ Apply an approximate 0.3Hz sinewave of fullscale amplitude to both X and Y_1 (with X and Y sensitivity the same).

⑨ With the frequencies increased as shown below, adjust the PHASE trimmer so that there is no space between between the two lines recorded, as shown in Fig. 4-8.

1-Pen type: 1.2Hz (1Hz standard)
2-Pen type: 0.9Hz (0.7Hz standard)

Fig. 4-8

4.5 Time Sweep

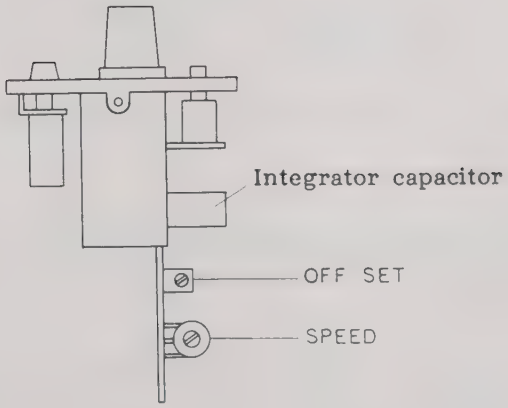


Fig. 4-9

OFFSET (R12)

① Adjust the OFFSET trimmer so that the pen position does not change when the time sweep panel X/OFF/Y switch is changed from the OFF position to either X or Y.

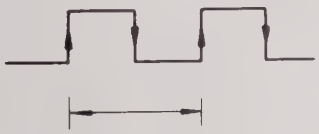
SPEED (R13)

② Set the X/OFF/Y switch to X.

③ Set the RANGE to 1cm/s.

④ Apply a low-amplitude (approx. 5mm) 1Hz squarewave to the swept axis and to the opposing axis.

⑤ Set the RESET/START switch to START to begin the sweep. Adjust the SPEED trimmer so that 1 period of the squarewave is 1cm.



1s = 1cm

CAUTION

o The servo amplifier sensitivities must be matched for the time sweep speed adjustment to be made (verify the pen tips).

o The time sweep speed adjustment may be made using a voltage setting. The actual measured capacitance of the integrator capacitor C4 is marked on the capacitor, so that this capacitance may be used to adjust the integrator reference voltage (the nominal value of C4 is 2.2μF).

If the actual value of C4 is 2.3μF, adjust the SPEED trimmer so that the lead land No. 22 on the time sweep board is at a voltage of 0.23V.

4.6 Preamplifier (Z)

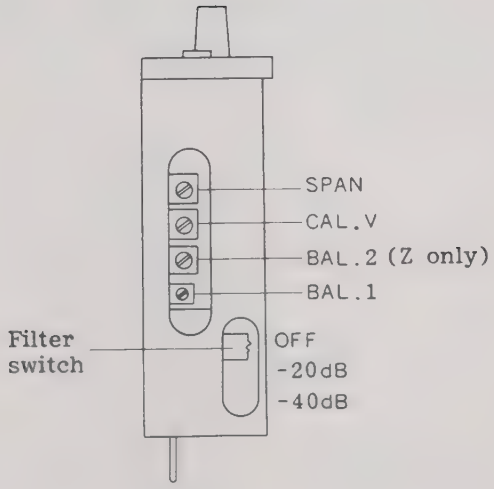


Fig. 4-10

① Set all trimmers to the approximate center position.

② Set the MEAS/OFF switch to OFF and the mV/V switch to mV.

BAL.1 (R9)

③ Adjust the BAL.1 trimmer so that, at maximum sensitivity, the pen position is the same as that at minimum sensitivity.

④ Connect a 10 ∿ 20kΩ resistance between the (+) and (-) input terminals.

BAL.2 (R5)

⑤ Adjust the BAL.2 trimmer so that the pen position when the MEAS/OFF switch is changed to MEAS is the same as that in the OFF position.

⑥ Set the sensitivity to 0.1V/cm.

SPAN (R21)

⑦ Set the position to the zero point and apply a fullscale voltage. (Remove the resistor between the (+) and (-) input terminals.)

Adjust the SPAN trimmer for fullscale deflection. Adjustment in the CW direction widens the span. (This is done with the GAIN trimmer in the extreme right position.)

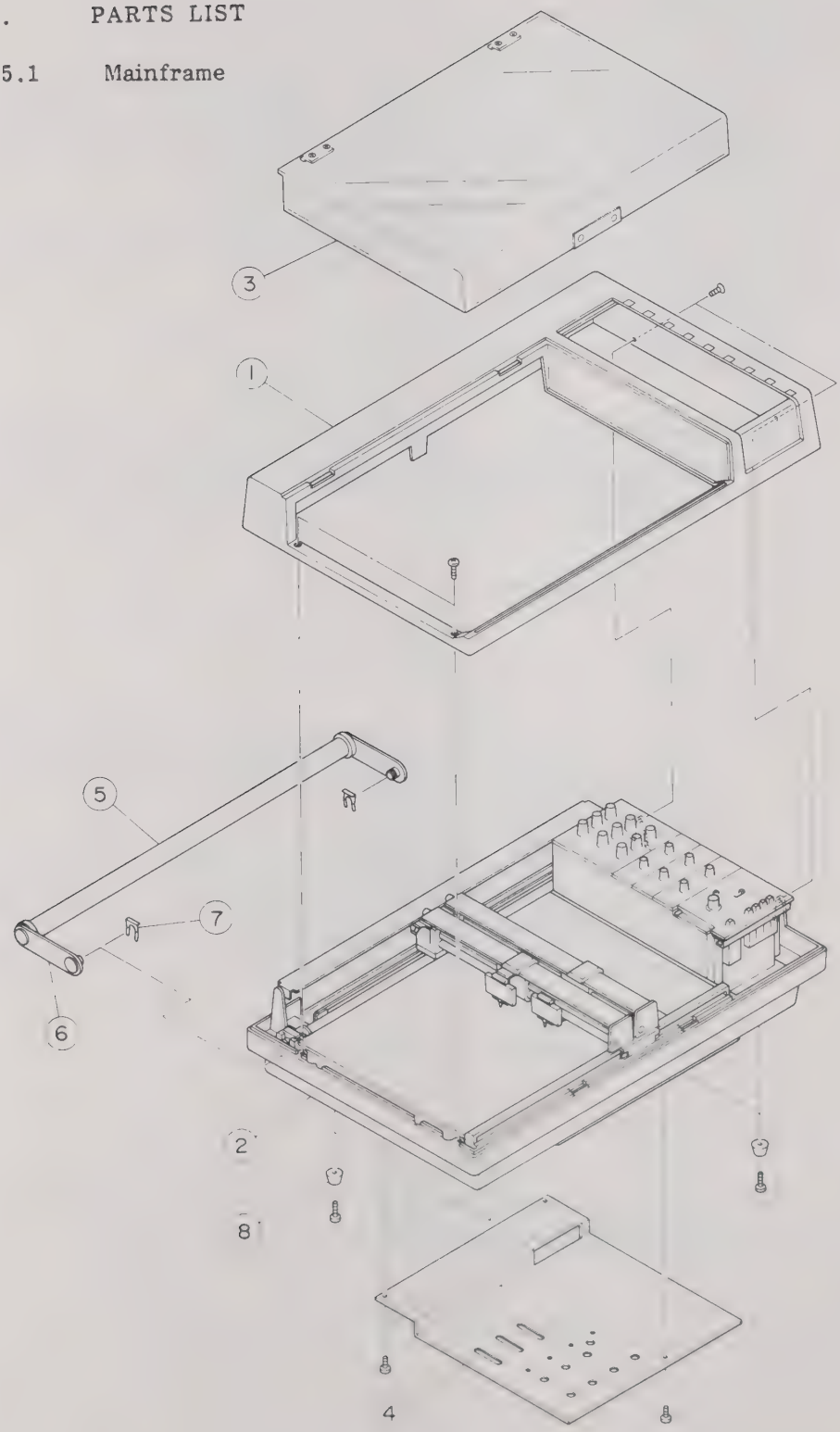
⑧ Set the MEAS/OFF switch to OFF.

CAL.V (R34)

⑨ Adjust the CAL.V trimmer so that the pen deflects 10cm with the CAL.V switch ON.

5. PARTS LIST

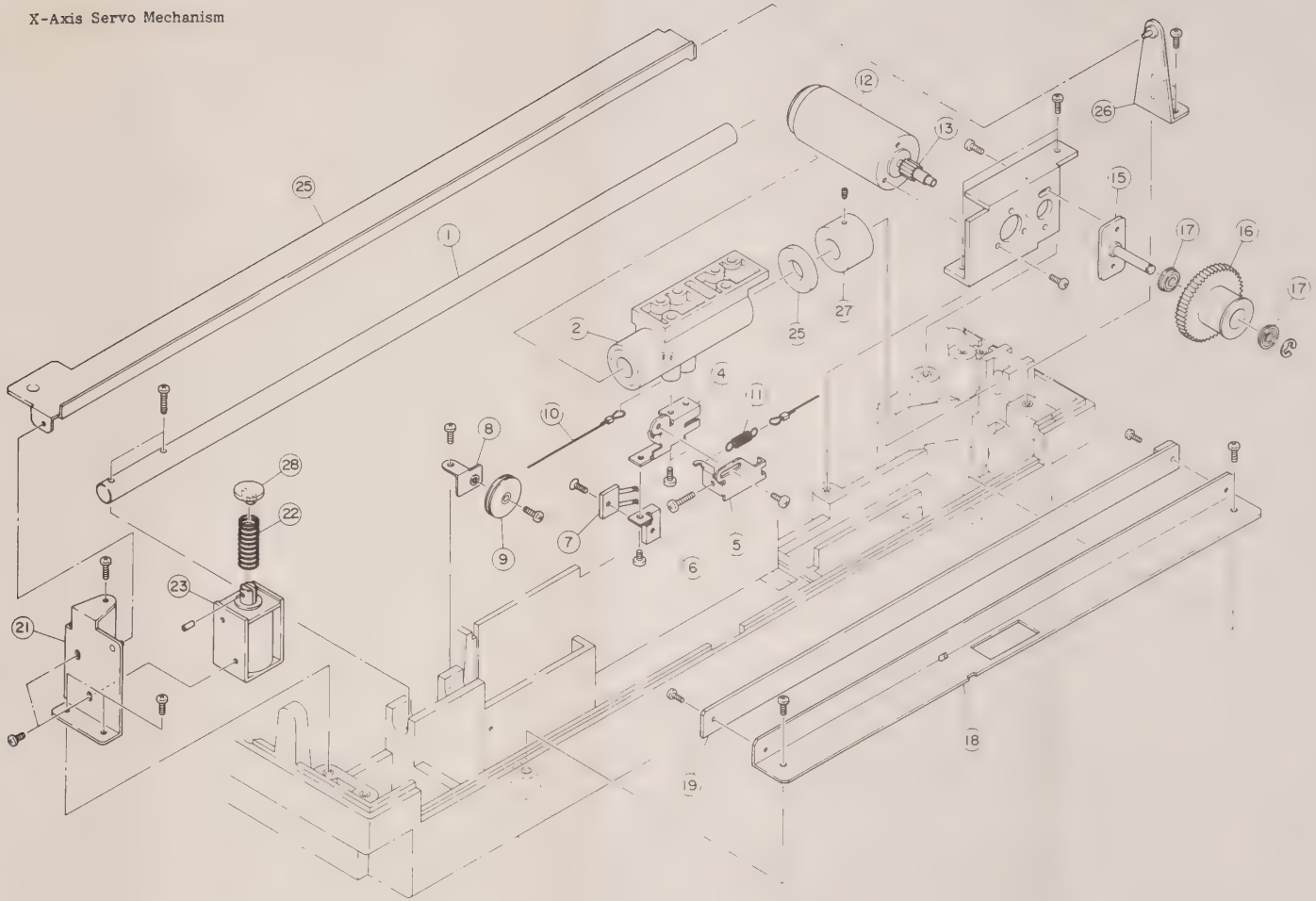
5.1 Mainframe



Main Frame

Item	Part No.	Description	Q'ty	Remarks
1	040010013	Upper Cover	1	
2	040010021	Main Frame	1	
3	040010031	Hard Cover	1	
4	040010502	Lower Cover	1	
5	040010271	Handle	1	
6	740010281	Arm, Handle	2	
7	040010320	Washer, Handle	2	
8	366311030	Cushion, K-23	4	

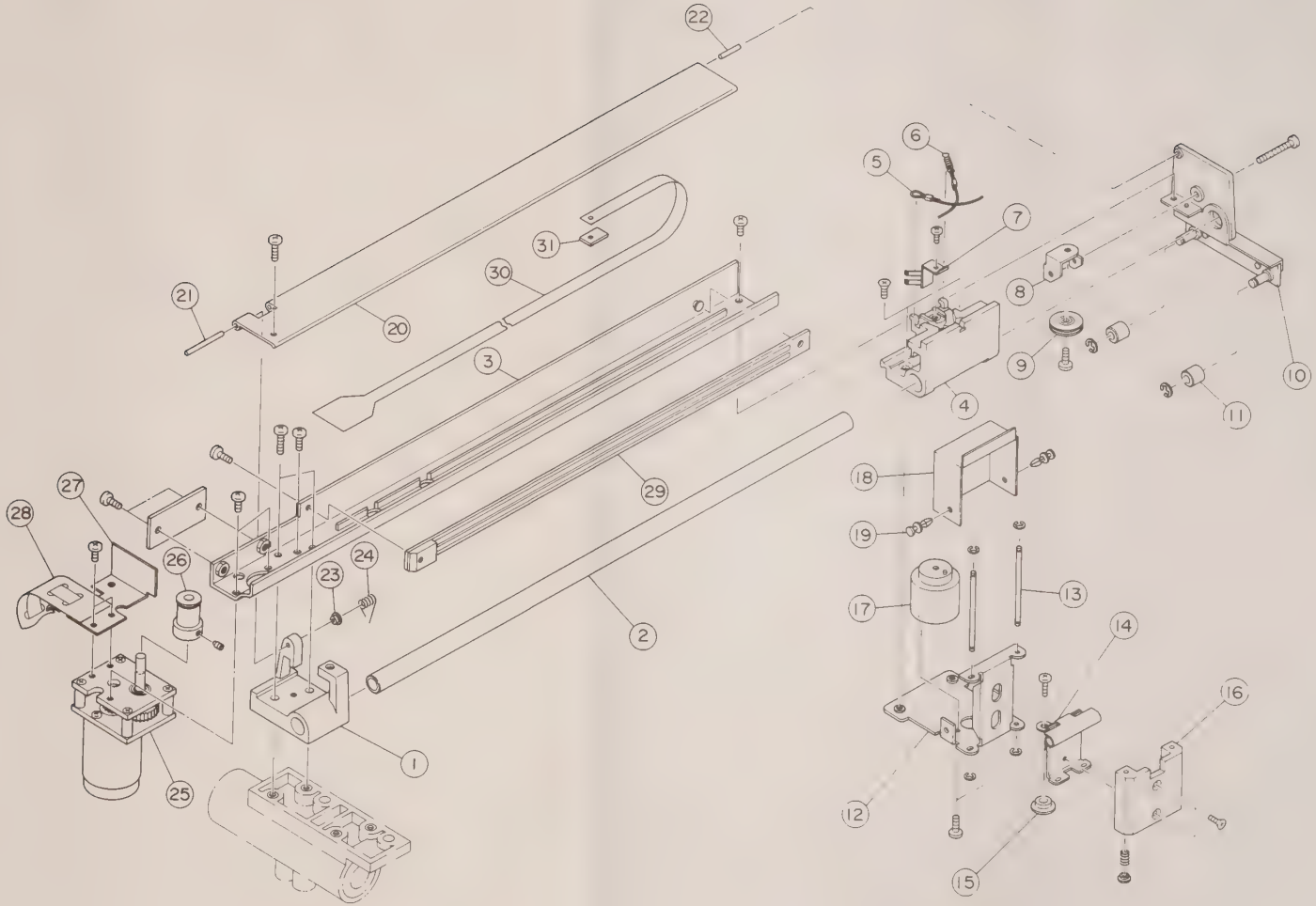
5.2 X-Axis Servo Mechanism



X-axis Servo Mechanism

Item	Part No.	Description	Q'ty	Remarks
1	040013010	Shaft, X	1	
2	740013020	Carriage, X	1	
3	040010111	Dumper, X	2	
4	040013002	Support, X Tension-A	1	
5	040013070	Support, X Tension-B	1	
6	040013080	Support, Contact	1	
7	767114210	Contact, X	1	
8	040013090	Support, Pulley Guide X	1	
9	352624003	Pulley Guide X	1	
10	040013101	Wire Ass'y, X	1	
11	040013111	Spring, X-axis	1	
12		Motor	1	
13	040013311	Pinion	1	1 pen
	040013421	Pinion	1	2 pens
14	040013121	Motor Holder	1	
15	740013160	Shaft, Drive Pulley X	1	
16	040013321	Drive Pulley X	1	1 pen
	040013411	Drive Pulley X	1	2 pens
17		Bearing, MF95ZZS	2	
18	040013150	Support, Potentiometer	1	
19	506211203	Potentiometer, X	1	
20				
21	740013511	Support, Solenoid	1	2 pens
22	040013540	Spring A, Solenoid	1	2 pens
23	515300014	Solenoid	1	2 pens
25	040013561	Bar, Pen Lift	1	2 pens
26	040013570	Support, Pen Lift Bar	1	2 pens
27	04001358	Spacer, X	1	2 pens
28	044413240	Cap	1	

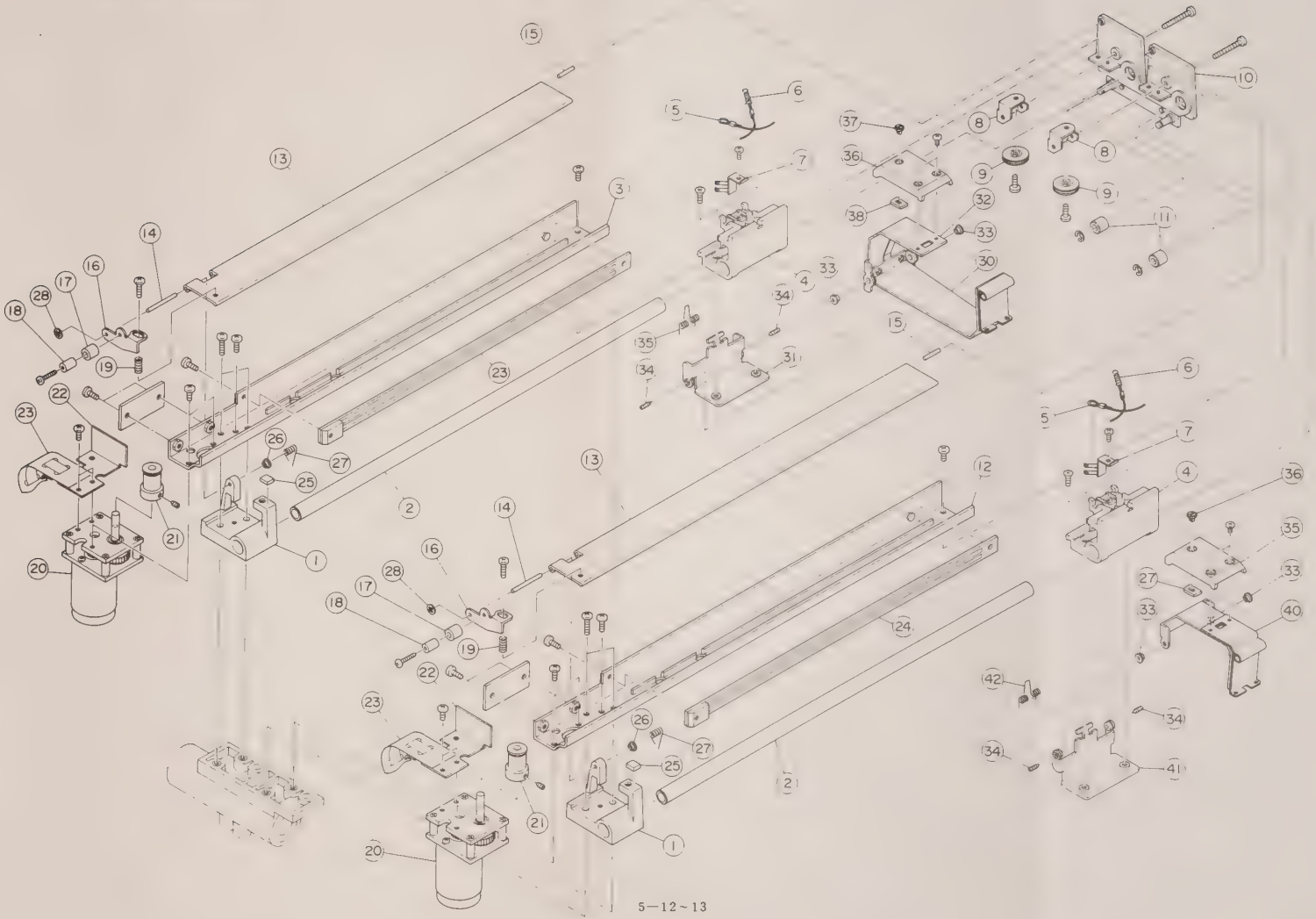
5.3 Y-Axis Servo Mechanism (1-Pen Type)



Y-axis Servo Mechanism (1 pen type)

Item	Part No.	Description	Q'ty	Remarks
1	040014010	Support, Y Bar	1	
2	040014030	Shaft, Y	1	
3	040014202	Y-Bar, 1 pen	1	
4	040014042	Cursole	1	
5	040014050	Wire Ass'y, Y	1	
6	040014060	Spring, Y-axis	1	
7	040014070	Contact, Y	1	
8	040014081	Support, Pulley Guide Y	1	
9	352220010	Pulley Guide Y	1	Pulley 2022
10	740014101	Support, X Roller (1 pen)	1	
11	351204001	X Roller, D BAR 4060 LD	2	
12	040014132	Base, 1 pen	1	
13	040014140	Shaft, 1 pen Slider	2	
14	040014150	Holder, 1 pen	1	
15	040014160	Spacer, 1 pen	1	
16	044314770	Slider	1	
17	740014000	Solenoid	1	
18	040014190	Pen Cover	1	
19	304500001	Rivet 3 x 3.5	2	
20	040014171	Bar, Y Scale	1	
21	390001002	Pin, 2 x L25	1	
22	390001003	Pin, 2 x L5.5	1	
23	040014180	Collar, Y Scale Bar	1	
24	040014500	Spring, Y Scale Bar	1	
25	74001600	Y Gear Box	1	
26	040016090	Y Pulley	1	
27	040013171	Support, Cable Guide	1	
28	511430190	FPC-533-C	1	
29	506211204	Potentiometer, Y	1	
30	043003440	A 3YFPC	1	
31	04001421	Plate, Cable	1	

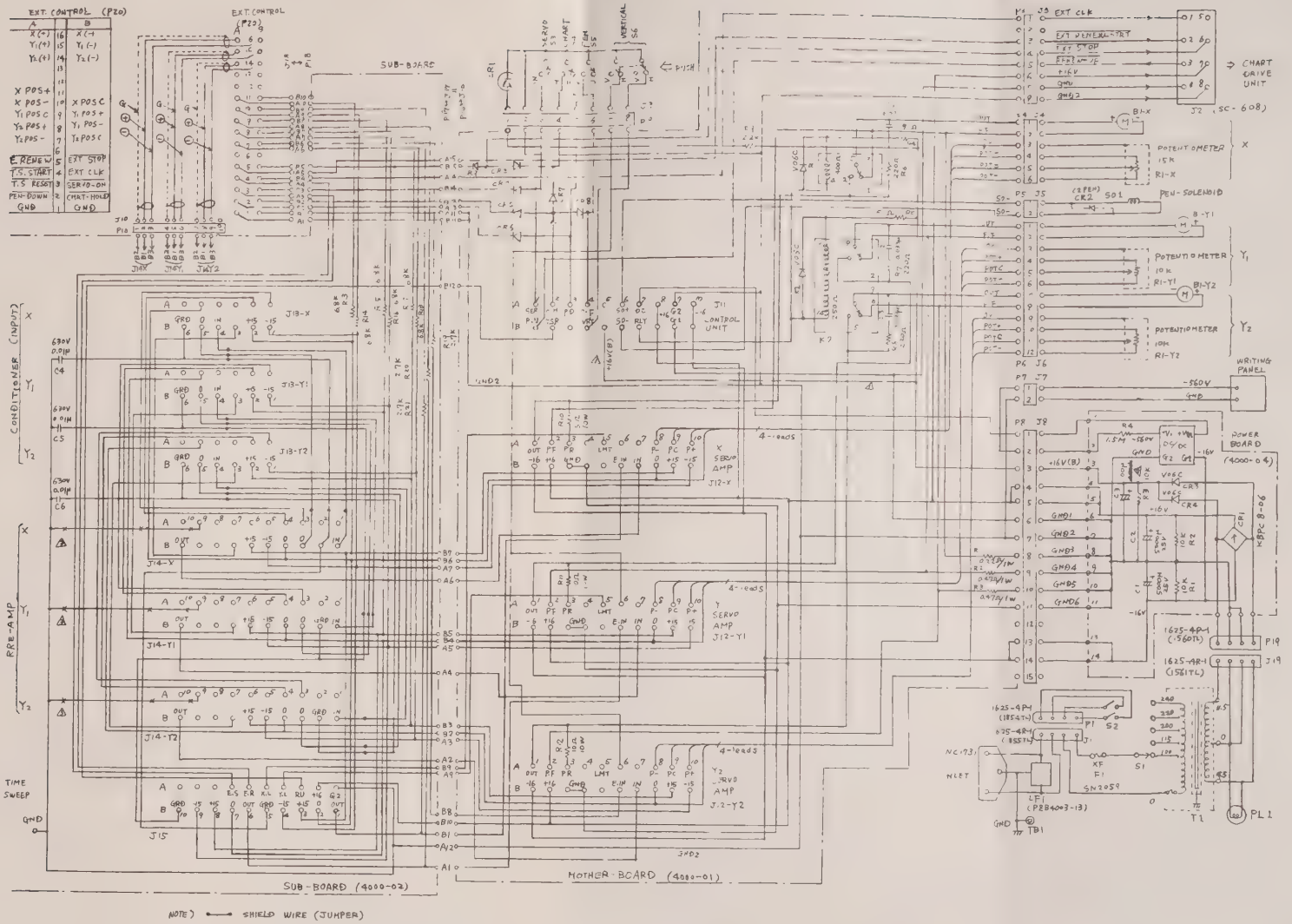
5.4 Y-Axis Servo Mechanism (2-Pen Type)



Y-axis Servo Mechanism (2 pen type)

Item	Part No.	Description	Q'ty	Remarks
1	040014010	Support, Y Bar	2	
2	040014030	Shaft, Y	2	
3	040014202	Y Bar, 1 pen	1	
4	040014042	Cursole	2	
5	040014050	Wire Ass'y, Y	2	
6	040014060	Spring, Y axis	2	
7	040014070	Contact, Y	2	
8	040014081	Support, Pulley Guide Y	2	
9		Pulley Guide Y	2	
10	740014311	Support, Pulley Guide Y	1	
11		X Roller	2	
12	040014512	Y Bar, 2 pens	1	
13	040014172	Bar, Y Scale	2	
14	390001002	Pin, 2 x L25	2	
15	390001003	Pin, 2 x L5.5	2	
16	040014541	Adjuster, Pen Lift	2	
17	040014531	Roller, Pen Lift	2	
18	304001510	Collar	2	
19	040014520	Spring, Pen Lift	2	
20	74001600	Y Gear Box	2	
21	040016090	Y Pulley	2	
22	040013171	Support, Cable Guide	2	
23	511430190	FPC-533-C	2	
24	506211204	Potentiometer, Y	2	
25	040014550	Cushion, Pen Lift	2	
26	040014180	Collar, Y Scale Bar	2	
27	040014500	Spring, Y Scale Bar	2	
28	304001500	Push Nut 2	2	
29				
30	740014331	1CH Pen-Arm Ass'y	1	
31	040014374	Holder, 1CH Pen	1	
32	040014383	Arm, 1CH Pen Lift	1	
33	040014570	Pivot Bearing PF-3	4	
34	040014580	Screw M2 x 5	4	
35	040014450	Spring, 1CH	1	
36	040014470	Cover, Pen Arm	2	
37	040014480	Pin, Pen Arm	2	
38	040014490	Cam, Pen Arm	2	
39				
40	740014392	2CH Pen-Arm Ass'y	1	
41	040014421	Holder, 2CH Pen	1	
42	040014600	Spring, 2CH	1	

5.5 Wiring Diagram, Power/Mother/Sub Board



Wiring Diagram

Figure	Part No.	Description	Type	Remarks
W1	520100008	AC Cord	VM1165B-VM1172	
INLET	513100918	INLET	NC173	
LF1	518110007	Line Filter	PZB4003-13	
XF1	512400002	Fuse Holder	SN-2059	
F1	512300002	Fuse 2A	SM-1101-2A	For 100V series
F1	512300001	" 1A	SM-1101-1A	For 200V series
S1	507101105	AC Selector	SJ2875-01	
S2	508101010	Switch, Push AC 250V, 4A	1P-0008AC1920	
S3~S6	508201220	" , "	SUE40	
CAP	516100009	Cap, Red	B101	For S2
CAP	516100020	" , Black	B911	For S3~S5
CAP	516100025	" , Ivory	B201	For S6
T1	510400010	Transformer	WX4000	
PL1	512100004	Lamp	A71	
SOCKET	512200003	Lamp Socket	S3512	For PL1
J1	513200404	Connector, Receptacle, 4P	1625-2R-1	
CNP	513400002	Contact Pin	1855TL	For J1
P1	513200403	Connector, Plug, 4P	1625-2P-1	
CNP	513400001	Contact Pin	1854TL	For P1
J2	513100919	Connector, Receptacle, 8P	SC-1608	
CNP	513201206	Contact Pin	SC-1600-111	For J2
J3	513400080	Connector, Receptacle, 8P	HNC2-2.5S-8	
CNP	513400037	Contact Pin	HNC-2.5S-A	For J3
J4	513400036	Connector, Receptacle, 6P	HNC2-2.5S-6	
CNP	513400037	Contact Pin	HNC-2.5S-A	X2 } For J4
CNP	513400042	" "	HNC-25S-B	X4 } For J4
J5	513400043	Connector, Receptacle, 2P	HNC2-2.5S-2	
CNP	513400037	Contact Pin	HNC-2.5S-A	For J5
J6	513400065	Connector, Receptacle, 12P	HNC2-2.5S-12	
CNP	513400042	Contact Pin	HNC-2.5S-B	For J6
J7	513400043	Connector, Receptacle, 2P	HNC2-2.5S-2	
CNP	513400037	Contact Pin	HNC-2.5S-A	For J7
J9	513400080	Connector, Receptacle, 8P	HNC2-2.5S-8	
CNP	513400037	Contact Pin	HNC-2.5S-A	For J9
J10	513400072	Connector, Receptacle, 10P	HNC2-2.5S-10	
CNP	513400042	Contact Pin	HNC-2.5S-B	For J10
FC	520110125	Flat Cable with Connector, 20P, 170 mm	L170-20P-FCN	J18↔P20
J19	513200404	Connector, Receptacle, 4P	1625-4R-1	
CNP	513400022	Contact Pin	1561TL	For J19
P20	513400149	Connector, Plug, 32P	FCN-361P032-AG	
NUT	520110081	Nut	FCN-360A4	For P20
J20	513400141	Connector, Receptacle, 32P	FCN-361J032-AG	
COVER	513400142	Cover	FCN-360C032-B	For J20

Figure	Part No.	Description	Type	Remarks
TB1	514400004	Terminal, Metal	SQ0204-02	
CR1	512100023	Di, LED, Red	TLR102KB	
CR2	503100021	Di, Si, V_R = 30V, I_F = 1.1A	V06C	For WX2400-2
B1-X	509100023	DC Motor DC 9V	28D11-219P-2	
B1-Y1	509100024	" " "	23L21-216E-1	
B1-Y2	"	" " "	"	For WX2400-2
R1-X	506211203	R, Potentiometer 15K	JCS283-0.1	
R1-Y1	506211204	R, " 10K	JCS194-0.1	
R1-Y2	"	R, " "	"	For WX2400-2
S01	740014000	Solenoid, 18Ω	GM-1	For WX2400-1
S01	515300014	Solenoid, DC 6V, 9Ω	SB102-C-6VDC	For WX2400-2
TB2-Xa	514400010	INPUT TERMINAL RED	W-R-2	
TB2-Xb	514400010	" " RED	W-R-2	
TB2-Xc	514400011	" " BLACK	W-B-2	
TB2-Y1a	514400010	" " RED	W-R-2	
TB2-Y1b	514400010	" " RED	W-R-2	
TB2-Y1c	514400011	" " BLACK	W-B-2	
TB2-Y2a	514400010	" " RED	W-R-2	For WX2400-2
TB2-Y2b	514400010	" " RED	W-R-2	For WX2400-2
TB2-Y2c	514400011	" " BLACK	W-B-2	For WX2400-2
PCB	044213450	Printed Circuit Board	CHUKEIKIBAN	
FPC	043003440	Flat Printed Cable	A3YFPC	

Power Board

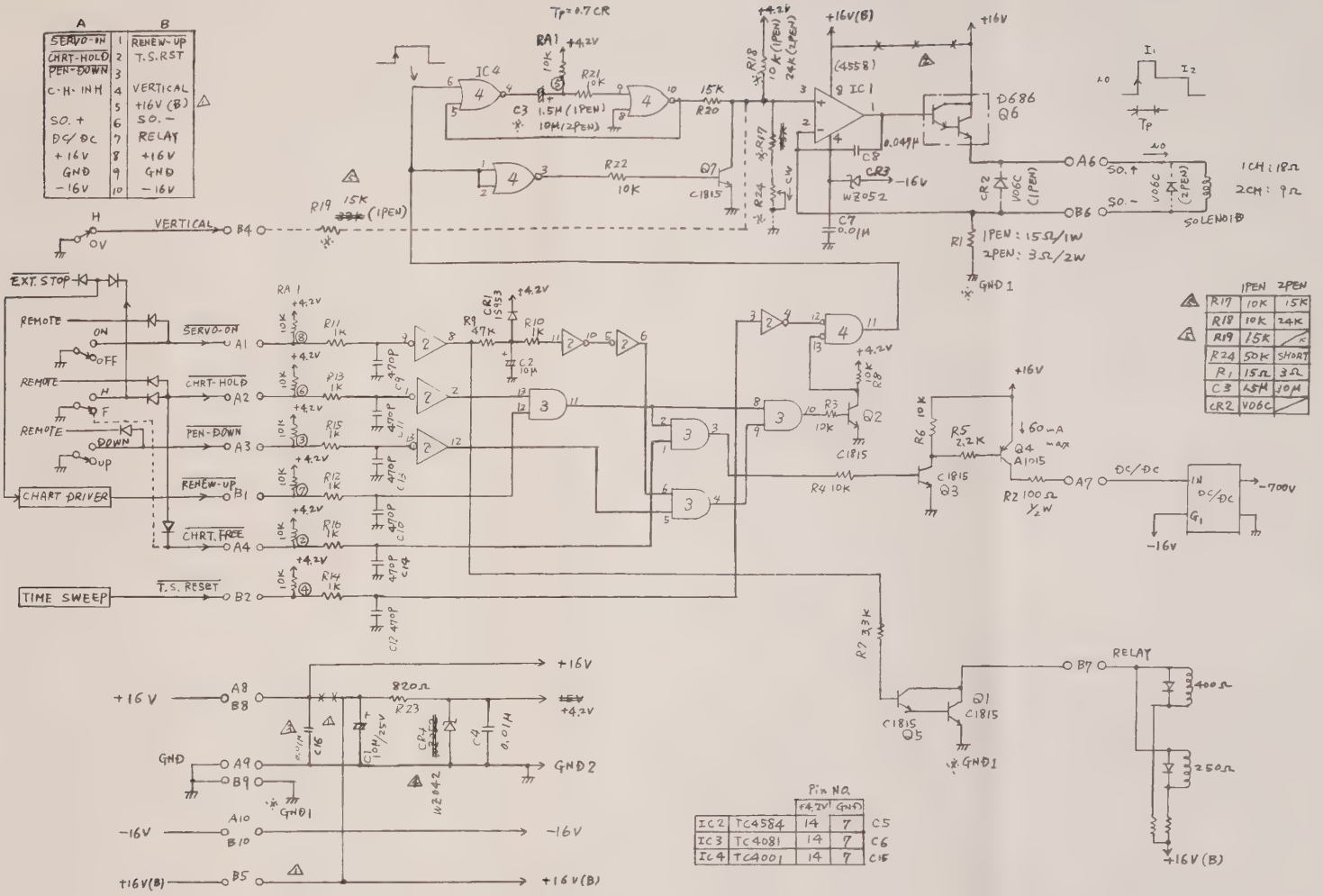
Figure	Part No.	Description	Type	Remarks
PCB	511400050	Printed Circuit Board	4000-04A	
J8	513400084	Connector, Receptacle, 15P	HNC2-2.5S-15	
CNP	513400037	Contact Pin	HNC-2.5S-A	For J8
P19	513200403	Connector, Plug, 4P	1625-4P-1	
CNP	513400021	Contact Pin	1560TL	For P19
CR1	503100051	Di, Bridge V_R = 600V I_F = 6A	KBPC8-06	
CR3	503100021	Di, Si V_R = 30V I_F = 1.1A	V06C	
CR4	〃	Di, Si 〃 〃	〃	
C1	502103064	C, Electrolytic 1500μ 25V	ECES1EV153X	
C2	〃	C, 〃 〃 〃	〃	
C3	502503018	C, 〃 100μ 25V	SL25VB100	
R1	501810410	R, Metal Film 10K 1/4W ±1%	RN1/4-10KF	
R2	〃	R, 〃 〃 〃 〃 〃	〃	
R3	〃	R, 〃 〃 〃 〃 〃	〃	
R4	501810615	R, 〃 〃 1M 〃 〃	RN1/4-1.5MF	
DC/DC	518100003	DC/DC Converter	ETW-R35DT1A1	

Mother Board

Figure	Part No.	Description	Type	Remarks
PCB	511400030	Printed Circuit Board	4000-01A	
P3	513400105	Connector, Pin Header, 8P	HNC2-2.5P8DSL	
P4	513400062	" " 6P	HNC2-2.5P6DS	
P5	513400038	" " 2P	HNC2-2.5P2DS	
P6	513400078	" " 12P	HNC2-2.5P12DS	
P7	513400106	" " 2P	HNC2-2.5P2DSL	
P8	513400085	" " 15P	HNC2-2.5P15DS	
P9	513400079	" " 8P	HNC2-2.5P8DS	
FC	520110124	Flat Cable with Connector, 30P, 112 mm	L112-30P-PS	P16 ↔ J17
K1	515110025	Relay DC 12V 400Ω	HA1-DC 12V	
K2	515100031	" " 250Ω	HB2-DC 12V	
J11	513300604	Connector Card Edge 10P x 2	225J21021-487	
J12-X	"	" " " " "	"	
J12-Y1	"	" " " " "	"	
J12-Y2	"	" " " " "	"	For WX2400-2
CR1	503100021	Di, Si V_R = 200V I_F = 1.1A	V06C	
CR2	"	Di, " " "	"	
CR3	503100020	Di, Si V_R = 30V I_F = 0.1A	1S953	
CR4	"	Di, " " "	"	
CR5	"	Di, " " "	"	
CR6	"	Di, " " "	"	
CR7	"	Di, " " "	"	
CR8	"	Di, " " "	"	
CR9	"	Di, " " "	"	
C1	502303009	C, Myler Film 0.033μ 50WV	MFL-05S33	
C2	"	C, " " " " "	"	
C3	"	C, " " " " "	"	For WX2400-2
R1	501605732	R, Wirewound 0.22Ω 1W ±5%	RSF1B-0.22J	
R2	501605733	R, " 0.47Ω " "	RSF1B-0.47J	
R3	"	R, " " " " "	"	For WX2400-2
R4	501810191	R, Metal Film 91Ω 1/4W ±1%	RN1/4-91F	
R5	501810151	R, " " 51Ω " "	RN1/4-51F	
R6	501810222	R, " " 220Ω " "	RN1/4-220F	
R7	"	R, " " " " "	"	
R8	"	R, " " " " "	"	
R9	501810322	R, " " 2.2K " "	RN1/4-2.2KF	
R10	501609725	R, Wirewound 5Ω 10W ±5%	MU10P-5J	
R11	501609726	R, " 10Ω " "	MU10P-10J	
R12	"	R, " " " "	"	

Sub Board

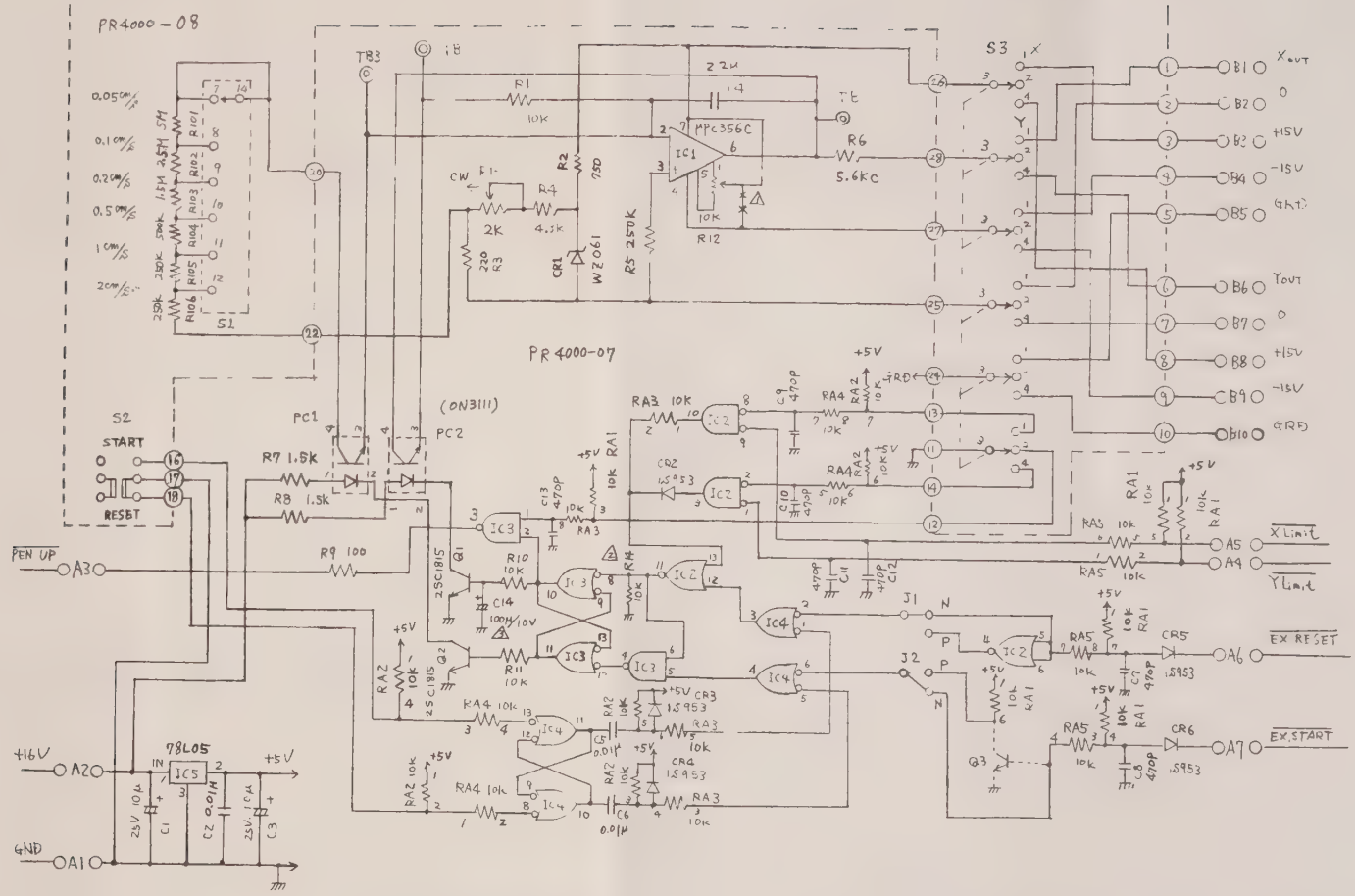
Figure	Part No.	Description	Type	Remarks
PCB	511400040	Printed Circuit Board	4000-02A	
J13-X	513300602	Connector, Card Edge 6P x 2	225J20621-487	
J13-Y1	"	" " " "	"	
J13-Y2	"	" " " "	"	For WX2400-2
J14-X	513300604	" " " 10P x 2	225J21021-487	
J14-Y1	"	" " " "	"	
J14-Y2	"	" " " "	"	For WX2400-2
J15	"	" " " "	"	
P10	513400040	Connector, Pin Header 10P	HNC2-2.5P10DS	
P17	513400139	" " " 30P	PS-30PE-D4T1-PN1	
P18	513400140	" " " 20P	FCN-744P020-AU/R	
C4	502601004	C, Oil 0.01μ 630WV	OP63T-01	
C5	"	C, " " "	"	
C6	"	C, " " "	"	For WX2400-2
R13	501810368	R, Metal Film 6.8K 1/4W ±1%	RN1/4-6.8KF	
R14	"	R, " " " " " "	"	
R15	"	R, " " " " " "	"	
R16	"	R, " " " " " "	"	
R17	"	R, " " " " " "	"	For WX2400-2
R18	"	R, " " " " " "	"	For WX2400-2
R19	501810327	R, " " 2.7K " "	RN1/4-2.7KF	For WX2400-2
R20	"	R, " " " " " "	"	
R21	"	R, " " " " " "	"	


A
B
SERVO-ON
CHRT-HOLD
PEN-DOWN
C·H· INH
SO. +
DC/DC
+16V
GND
-16V
RENEW-UP
T.S.RST
VERTICAL
+16V (B)
SO. −
RELAY
+16V
GND
-16V
Tp=0.7CR
RA1
+4.2V
IC4
C3 1.5M (1PEN)
10M (2PEN)
R21 10K
15K R20
R18 10K
24K (2PEN)
(4558) IC1
+16V(B)
+16V
D686
Q6
R17
C8 0.047μ
CR3 WZ052 -16V
R22 10K
Q7 C1815
R24
C4
CR2 V06C (1PEN)
A6
SO.+
SO.−
V06C (2PEN)
1CH: 18Ω
2CH: 9Ω
SOLENOID
B6
C7 0.01M
R1 1PEN: 15Ω/1W
2PEN: 3Ω/2W
GND1
R19 15K (1PEN)
H
VERTICAL
OV
B4
EXT. STOP
REMOTE
ON
OFF
SERVO-ON
A1
CHRT-HOLD
A2
PEN-DOWN
A3
RENEW-UP
B1
CHRT. FREE
A4
T.S. RESET
B2
CHART DRIVER
TIME SWEEP
R11 1K
R13 1K
R15 1K
R12 1K
R16 1K
R14 1K
C9 470P
C11 470P
C13 470P
C10 470P
C14 470P
C12 470P
R9 47K
CR1 1S953
R10 1K
C2 10μ
R8 10K
R3 10K
Q2 C1815
R6 10K
R5 2.2K
Q4 A1015
60-A MAX
R4 10K
Q3 C1815
R2 100Ω ½W
A7
DC/DC
IN
G1
-700V
-16V
R7 3.3K
Q1 C1815
Q5 C1815
GND1
B7
RELAY
400Ω
250Ω
+16V(B)
+16V
A8
B8
820Ω R23
+4.2V
C16 0.01M
C15 10M/25V
CR4 WZ042
C4 0.01M
GND
A9
B9
GND2
GND1
-16V
A10
B10
-16V
+16V(B)
B5
+16V(B)
I1
I2
Tp
1PEN 2PEN
R19 10K 15K
R18 10K 24K
R19 15K K
R24 50K SHORT
R1 15Ω 3Ω
C3 1.5M 10M
CR2 V06C
Pin No.
+4.2V GND
IC2 TC4584 14 7 C5
IC3 TC4081 14 7 C6
IC4 TC4001 14 7 C15

Control Unit

Figure	Part No.	Description	Type	Remarks
PCB	511400060	Printed Circuit Board	4000-05A	
IC1	503300054	IC OP-Amp Dual	UPC4558C	
IC2	503301016	IC CMOS	TC4584BP	
IC3	503303371	IC CMOS	TC4081UBP	
IC4	503300124	IC CMOS	TC4001BP	
Q1	503203014	T, NPN 100mA 200mW	2SC1815	
Q2	"	T, " " "	"	
Q3	"	T, " " "	"	
Q4	503203016	T, PNP −100mA 200mW	2SA1015	
Q5	503203014	T, NPN 100mA 200mW	2SC1815	
Q6	503200024	T, NPN Darlington 4A	2SD686	
Q7	503203014	T, NPN 100mA 200mW	2SC1815	
C1	502103023	C, Electrolytic 10μ 25WV	SM25VB-10	
C2	"	C, " " "	"	
C3	502203024	C, Tantalum 1.5μ 20WV	CS15E1D1R5M	For WX2400-1
C3	502103023	C, Electrolytic 10μ 25WV	SM25VB10	For WX2400-2
C4	502303004	C, Myler Film 0.01μ 50WV	MFL-05S1	
C7	502303004	C, Myler Film 0.01μ 50WV	MFL-05S1	
C8	502303005	C, " " 0.047μ 50WV	MFL-05S47	
C9	502403003	C, Ceramic 470P 50WV	USD04-SL-471K	
C10	"	C, " " "	"	
C11	"	C, " " "	"	
C12	"	C, " " "	"	
C13	"	C, " " "	"	
C14	"	C, " " "	"	
CR1	503100020	Di, Si V_R = 30V I_F = 0.1A	1S953	
CR2	503100021	Di, Si V_R = 200V I_F = 1.1A	V06C	For WX2400-1
CR3	503100060	Di, Zenner 5.2V 1/2W	WZ052	
CR4	503100058	Di, " 4.2V 1/2W	WZ042	
RA1	501002813	Resister Array 10K x 8	RM8-103J	
R1	501605734	R, Metal Film 15Ω 1W ±5%	RSF1B-15J	For WX2400-1
R1	501605735	R, " " 3Ω 2W ±5%	RSF2B-3J	For WX2400-2
R3	501810410	R, " " 10K 1/4W ±1%	RN1/4-10KF	
R4	"	R, " " " " "	"	
R5	501810322	R, " " 2.2K 1/4W ±1%	RN1/4-2.2KF	
R6	501810410	R, " " 10K " "	RN1/4-10KF	
R7	501810333	R, " " 3.3K " "	RN1/4-3.3KF	
R8	501810410	R, " " 10K " "	RN1/4-10KF	
R9	501810447	R, " " 47K " "	RN1/4-47KF	
R10	501810310	R, " " 1K " "	RN1/4-1KF	

Figure	Part No.	Description				Type	Remarks
R11	501810310	R, Metal Film	1K	1/4W	±1%	RN1/4-1KF	
R12	〃	R, 〃 〃	〃	〃	〃	〃	
R13	〃	R, 〃 〃	〃	〃	〃	〃	
R14	〃	R, 〃 〃	〃	〃	〃	〃	
R15	〃	R, 〃 〃	〃	〃	〃	〃	
R16	〃	R, 〃 〃	〃	〃	〃	〃	
R17	501810410	R, 〃 〃	10K	〃	〃	RN1/4-10KF	For WX2400-1
R17	501810415	R, 〃 〃	15K	〃	〃	RN1/4-15KF	For WX2400-2
R18	501810410	R, 〃 〃	10K	〃	〃	RN1/4-10KF	For WX2400-1
R18	501810424	R, 〃 〃	24K	〃	〃	RN1/4-24KF	For WX2400-2
R19	501810415	R, 〃 〃	15K	〃	〃	RN1/4-15KF	For WX2400-1
R20	〃	R, 〃 〃	〃	〃	〃	〃	
R21	501810410	R, 〃 〃	10K	〃	〃	RN1/4-10KF	
R22	〃	R, 〃 〃	〃	〃	〃	〃	
R23	501810282	R, 〃 〃	820Ω	〃	〃	RN1/4-820F	
R24	505103024	R, Trimmer Cermet	50K			GF6X-50K	For WX2400-1

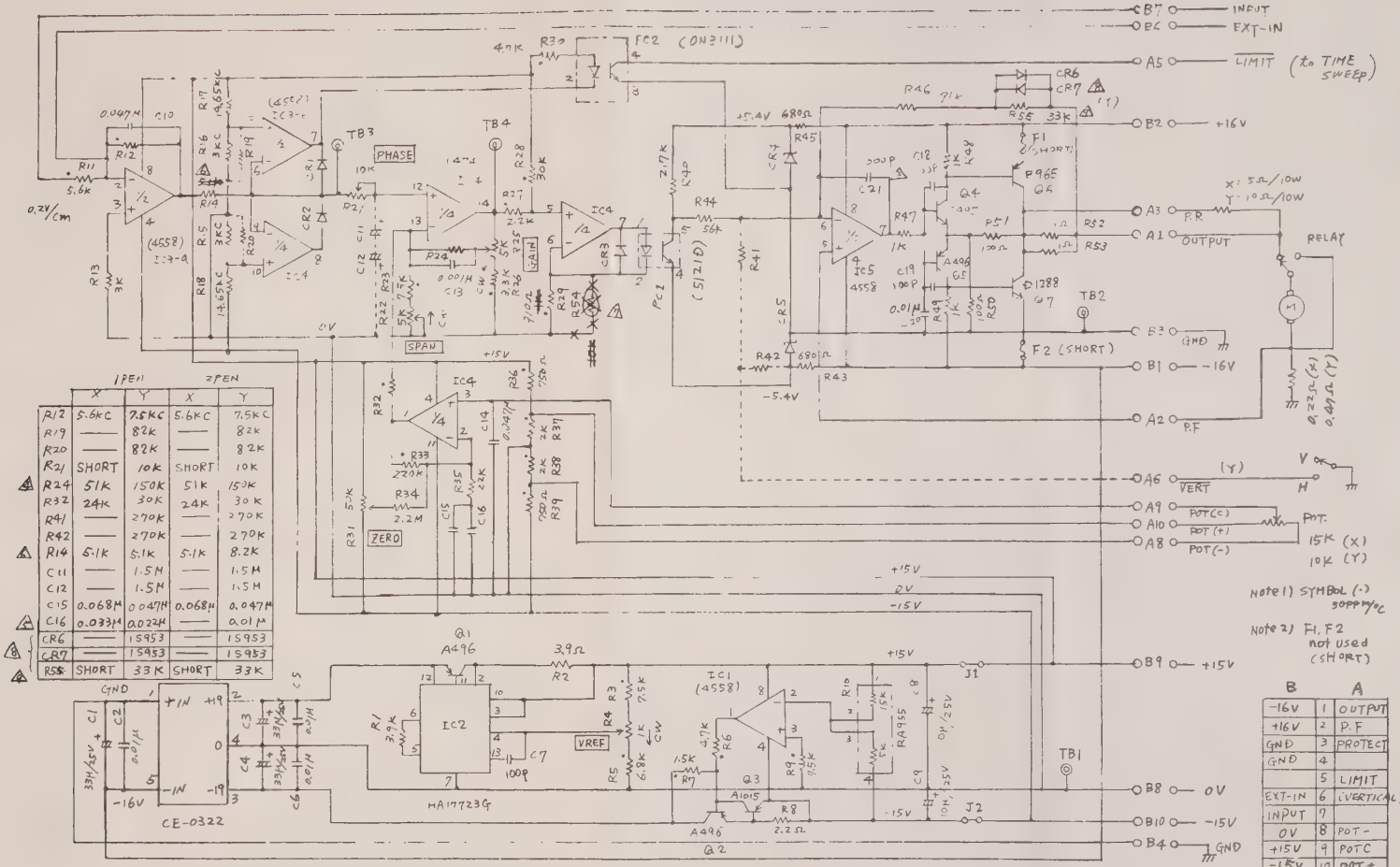


		+5V	GND
IC 2	TC4001	14P	7P
IC 3.4	TC4011	14P	7P

Time Sweep Unit

Figure	Part No.	Description			Type	Remarks
PCB	511400010	Printed Circuit Board			4000-07B	
PCB	511400020	〃 〃 〃			4000-08B	
S1	508101021	SW, Rotary			SRM1026-L15R-R	
S2	508302017	SW, Slide			SSB022L12, P, NS	
S3	508306007	SW, Slide			SSB063L12, P	
TB1	513400027	Test Terminal			LC-1-G	
TB2	〃	〃 〃			〃	
TB3	〃	〃 〃			〃	
IC1	503303468	IC, OP-Amp FET-Top			UPC356C	
IC2	503300124	IC, CMOS			TC4001UBP	
IC3	503300062	IC, 〃			TC4011UBP	
IC4	〃	IC, 〃			〃	
IC5	503300087	IC, Regulator	5V		78L05UC	
Q1	503203014	T, NPN	100mA	200mW	2SC1815	
Q2	〃	T, 〃	〃	〃	〃	
CR1	503100001	Di, Zenner	6.1V	500mW	WZ061	
CR2	503100020	Di, Si	V_R = 30V	I_F = 100mA	1S953	
CR3	〃	Di, 〃	〃	〃	〃	
CR4	〃	Di, 〃	〃	〃	〃	
CR5	〃	Di, 〃	〃	〃	〃	
CR6	〃	Di, 〃	〃	〃	〃	
C1	502103023	C, Electrolytic	10μ	25WV	SM25VB-10	
C2	502403007	C, Ceramic	0.01μ	50WV	ULD06-103-L2A	
C3	502103023	C, Electrolytic	10μ	25WV	SM25VB-10	
C4	502503002	C, Myler Film	2.2μ	100WV	EML2.2-100	
C5	502403007	C, Ceramic	0.01μ	50WV	ULD06-103-L2A	
C6	〃	C, 〃	〃	〃	〃	
C7	502403003	C, 〃	470P	〃	USD04-SL-471K	
C8	〃	C, 〃	〃	〃	〃	
C9	〃	C, 〃	〃	〃	〃	
C10	〃	C, 〃	〃	〃	〃	
C11	〃	C, 〃	〃	〃	〃	
C12	〃	C, 〃	〃	〃	〃	
C13	〃	C, 〃	〃	〃	〃	
C14	502103034	C, Electrolytic	100μ	10WV	ECEA1AS101	
PC1	503301060	Photo Coupler			ON3111-R	
PC2	〃	〃 〃			〃	

Figure	Part No.	Description			Type	Remarks
RA1	501003339	Resistor Array	10K x 6		EXBP8-6-103J	
RA2	〃	〃 〃	〃		〃	
RA3	501003336	〃 〃	10K x 4		EXBT4-4-103J	
RA4	〃	〃 〃	〃		〃	
RA5	〃	〃 〃	〃		〃	
R1	501810410	R, Metal Film	10K	1/4W ±1%	RN1/4-10KF	
R2	501810275	R, 〃 〃	750Ω	〃 〃	RN1/4-750F	
R3	501810222	R, 〃 〃	220Ω	〃 〃	RN1/4-220F	
R4	501810343	R, 〃 〃	4.3K	〃 〃	RN1/4-4.3K	
R5	501810525	R, 〃 〃	250K	〃 〃	RN1/4-250K	
R6	501443645	R, 〃 〃	5.6K	1/8W ±0.25%	RP82C-5.6KC	
R7	501810315	R, 〃 〃	1.5K	1/4W ±1%	RN1/4-1.5KF	
R8	〃	R, 〃 〃	〃	〃 〃	〃	
R9	501810210	R, 〃 〃	100Ω	〃 〃	RN1/4-100F	
R10	501810410	R, 〃 〃	10K	〃 〃	RN1/4-10KF	
R11	〃	R, 〃 〃	〃	〃 〃	〃	
R12	505101025	R, Trimmer	10K		RJ20P-10K	
R13	504207022	R, 〃	2K		TM10KPH-2K	
R14	501810410	R, Metal Film	10K	1/4W ±1%	RN1/4-10KF	
R101	501503701	R, Metal Film	5M	±1%	RK14B2E-5MF	
R102	501503702	R, 〃 〃	2.5M	〃	RK14B2E-2.5MF	
R103	501810615	R, 〃 〃	1.5M	1/4W 〃	RN1/4-1.5MF	
R104	501810550	R, 〃 〃	500K	〃 〃	RN1/4-500KF	
R105	501810525	R, 〃 〃	250K	〃 〃	RN1/4-250KF	
	516100028	Knob, Black, with Line			023-342	For S1
	516100029	Cab, Black, with Line			044-362	For S1
	516100030	Nut Cover			044-322	For S1



	IPEN X	IPEN Y	2PEN X	2PEN Y
R12	5.6kC	7.5kC	5.6kC	7.5kC
R19	—	82k	—	82k
R20	—	82K	—	82K
R21	SHORT	10K	SHORT	10K
R24	51K	150K	51K	150K
R32	24K	30K	24K	30K
R41	—	270K	—	270K
R42	—	270K	—	270K
R14	5.1K	5.1K	5.1K	8.2K
C11	—	1.5M	—	1.5M
C12	—	1.5M	—	1.5M
C15	0.068M	0.047M	0.068M	0.047M
C16	0.033M	0.022M	—	0.01M
CR6	—	1S953	—	1S953
CR7	—	1S953	—	1S953
RSS	SHORT	33K	SHORT	33K

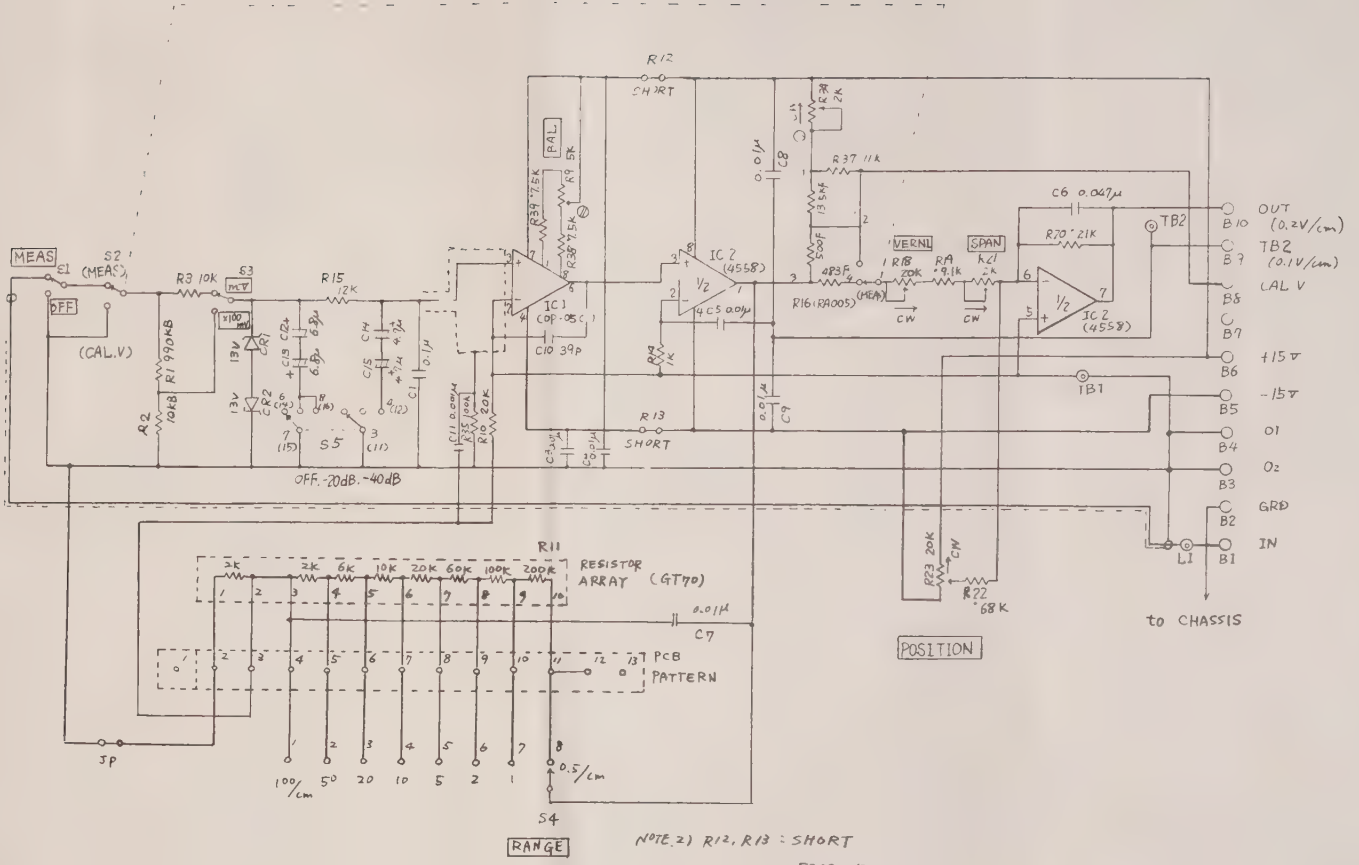
B		A
-16V	1	OUTPUT
+16V	2	P.F
GND	3	PROTECT
GND	4	
	5	LIMIT
EXT-IN	6	(VERTICAL)
INPUT	7	
0V	8	POT-
+15V	9	POTC
-15V	10	POT+

Servo Amplifier

Figure	Part No.	Description	Type	Remarks
PCB	511400070	Printed Circuit Board	4000-03B	
IC1	503300054	IC, Op-Amp, Dual	μPC4558C	
IC2	503300117	IC, Regulator	HA17723G	
IC3	503300054	IC, Op-Amp, Dual	μPC4558C	
IC4	503300034	IC, Op-Amp, Quad	μPC4741C	
IC5	503300054	IC, Op-Amp, Dual	μPC4558C	
CONV	518100007	DC/DC Converter	CE-0322	
PC1	503301155	Photo Coupler	NJL5121D-A	
PC2	503301060	" "	ON3111-R	
Q1	503200003	T, PNP −50V −1A 1W	2SA496-Y	
Q2	"	T, " " " "	"	
Q3	503203016	T, " −30V −100mA 200mW	2SA1015-Y	
Q4	503200011	T, NPN 50V 1A 1W	2SC495	
Q5	503200003	T, PNP −50V −1A 1W	2SA496-Y	
Q6	503203053	T, PNP −120V −7A 70W	2SB965-Q	
Q7	503203054	T, NPN 120V 7A 70W	2SD1288-Q	
CR1	503100020	Di, Si V_R = 30V I_F = 100mA	1S953	
CR2	"	Di, " " "	"	
CR3	"	Di, " " "	"	
CR4	503100003	Di, Zenner 5.4V 500mW	WZ054	
CR5	"	Di, " " "	"	
CR6	503100020	Di, Si V_R = 30V I_F = 100mA	1S953	Y Axis
CR7	"	Di, " " "	"	Y Axis
C1	502101028	C, Electrolytic 33μ 25WV	SM25VB-33	
C2	502403007	C, Ceramic 0.01μ 50WV	ULD06-103-L2A	
C3	502101028	C, Electrolytic 33μ 25WV	SM25VB-33	
C4	"	C, " " "	"	
C5	502403007	C, Ceramic 0.01μ 50WV	ULD06-103-L2A	
C6	"	C, " " "	"	
C7	502403009	C, " 100P 50WV	UF04-101K-K2J	
C8	502103023	C, " 10μ 25WV	SM25VB-10	
C9	"	C, " " "	"	
C10	502303005	C, Myler Film 0.047μ 50WV	MFL-05S47	
C11	502203024	C, Tantalum 1.5μ 20WV	CS15E1D1R5M	Y Axis
C12	"	C, " " "	"	Y Axis
C13	502303002	C, Myler Film 0.001μ 50WV	MFL-05D1	
C14	502303005	C, " " 0.047μ "	MFL-05S47	
C15	502303014	C, " " 0.068μ "	MFL-05S68	X Axis
C15	"	C, " " " "	"	Y Axis
C16	502303009	C, " " 0.033μ "	MFL-05S33	WX2400-1 X
C16	502303008	C, " " 0.022μ "	MFL-05S22	WX2400-1 Y
C16	502303004	C, " " 0.01μ "	MFL-05S1	WX2400-2 Y

Figure	Part No.	Description				Type	Remarks
C18	502403009	C, Ceramic	100P	50WV		UF04-101K-K2J	
C19	〃	C, 〃	〃	〃		〃	
C20	502403007	C, 〃	0.01μ	〃		ULD06-103-L2A	
C21	502403015	C, Ceramic	0.001μ	50WV		ULD06-102	
R1	501810339	R, Metal Film	3.9K	1/4W	±1%	RN1/4-3.9KF	
R2	501203783	R, Solid	3.9Ω	1/4W	±5%	RC1/4-3.9J	
R3	501443603	R, Metal Film	7.5K	〃	±1%	RP44C7.5KF	
R4	505103011	R, Trimmer	1K			GF06X-1K	
R5	501443607	R, Metal Film	6.8K	1/4W	±1%	RP44C-6.8KF	
R6	501443606	R, 〃 〃	4.7K	〃	〃	RP44C-4.7KF	
R7	501443610	R, 〃 〃	1.5K	〃	〃	RP44C-1.5KF	
R8	501203701	R, Solid	2.2	1/4W	±5%	RC1/4-2.2J	
R9	501443603	R, Metal Film	7.5K	〃	±1%	RP44C-7.5KF	
R10	501003313	R, Array	1.5K x 2		±0.1%	RA955	
R11	501443645	R, Metal Film	5.6K	1/4W	±0.25%	RP82C5.6KC	
R12	〃	R, 〃 〃	〃	〃	〃	〃	
R12	501443650	R, 〃 〃	7.5K	〃	〃	RP82C7.5KC	
R13	501810330	R, 〃 〃	3K	〃	±1%	RN1/4-3KF	
R14	501810351	R, 〃 〃	5.1K	〃	〃	RN1/4-5.1KF	X
R14	501810351	R, 〃 〃	〃	〃	〃	〃	WX2400-1 Y
R14	501810382	R, 〃 〃	8.2K	〃	〃	RN1/4-8.2KF	WX2400-2 Y
R15	501303305	R, 〃 〃	3K	〃	±0.25%	RNE1/4-3KC	
R16	〃	R, 〃 〃	〃	〃	〃	〃	
R17	501303331	R, 〃 〃	14.65K	〃	〃	RNE1/4-14.65KC	
R18	〃	R, 〃 〃	〃	〃	〃	〃	
R19	501810482	R, 〃 〃	82K	〃	±1%	RN1/4-82KF	Y
R20	〃	R, 〃 〃	〃	〃	〃	〃	Y
R21	505103016	R, Trimmer	10K			GF6X-10K	Y
R22	505103019	R, 〃	5K			GF6X-5K	
R23	501443603	R, Metal Film	7.5K	1/4W	±1%	RP44C7.5KF	
R24	501810451	R, 〃 〃	51K	〃	〃	RN1/4-51KF	X
R24	501810515	R, 〃 〃	150K	〃	〃	RN1/4-150KF	Y
R25	505103019	R, Trimmer	5K			GF6X-5K	
R26	501443646	R, Metal Film	3.3K	1/4W	±1%	RP44C3.3KF	
R27	501443647	R, 〃 〃	2.2K	〃	〃	RP44C2.2KF	
R28	501443642	R, 〃 〃	30K	〃	〃	RP44C30KF	
R29	501443634	R, 〃 〃	1K	〃	〃	RP44C1KF	
R30	501443606	R, 〃 〃	4.7K	〃	〃	RP44C4.7KF	
R31	505103024	R, Trimmer	50K			GF6X-50K	
R32	501443643	R, Metal Film	24K	1/4W	±1%	RP44C24KF	X
R32	501443642	R, 〃 〃	30K	〃	〃	RP44C30KF	Y
R33	501443641	R, 〃 〃	220K	〃	〃	RP42C220KF	
R34	501810622	R, 〃 〃	2.2M	〃	〃	RN1/4-2.2MF	
R35	501810422	R, 〃 〃	22K	〃	〃	RN1/4-22KF	

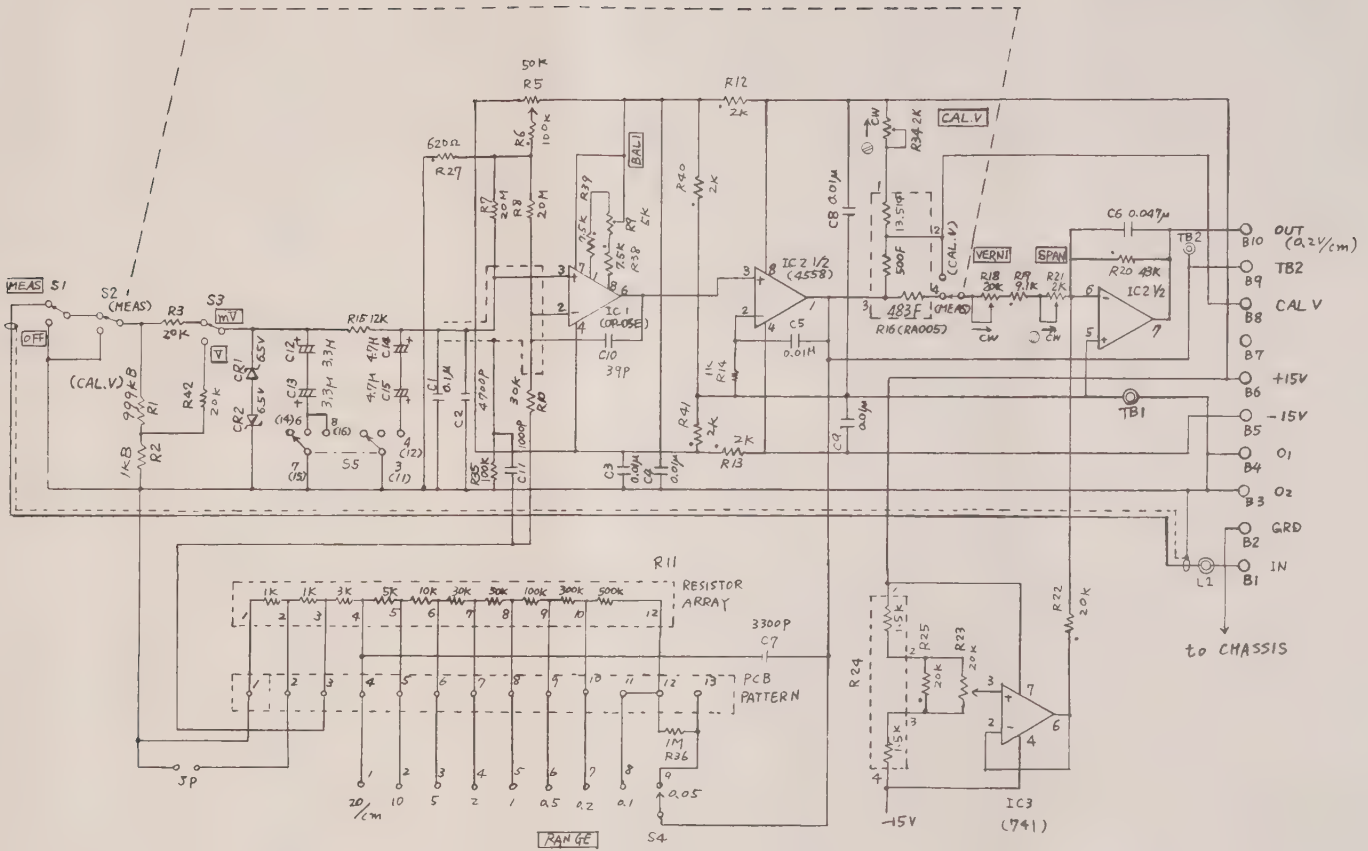
Figure	Part No.	Description				Type	Remarks
R36	501443626	R, Metal Film	750Ω	1/4W	±1%	RP44C750F	
R37	501443631	R, " "	2K	"	"	RP44C2KF	
R38	"	R, " "	"	"	"	"	
R39	501443626	R, " "	750Ω	"	"	RP44C750F	
R40	501810327	R, " "	2.7K	"	"	RN1/4-2.7KF	
R41	501810527	R, " "	270K	"	"	RN1/4-270KF	Y
R42	"	R, " "	"	"	"	"	Y
R43	501810268	R, " "	680Ω	"	"	RN1/4-680F	
R44	501810456	R, " "	56K	"	"	RN1/4-56KF	
R45	501810268	R, " "	680Ω	"	"	RN1/4-680F	
R46	501810491	R, " "	91K	"	"	RN1/4-91KF	
R47	501810310	R, " "	1K	"	"	RN1/4-1KF	
R48	"	R, " "	"	"	"	"	
R49	"	R, " "	"	"	"	"	
R50	501810210	R, " "	100Ω			RN1/4-100F	
R51	"	R, " "	"	"	"	"	
R52	502901001	R, Posistor	1Ω			012PD83B9-1R0M	
R53	"	R, "	"			"	
R55	501810433	R, Metal Film	33K	1/4W	±1%	RN1/4-33KF	Y
TB1	513400027	Test Terminal				LC-1-10	
TB2	"	" "				"	
TB3	"	" "				"	
TB4	"	" "				"	


MEAS
S1
S2
(MEAS)
OFF
(CAL.V)
R3 10K
S3
mV
R15 12K
R1 990KΩ
R2 10KΩ
100 mV
13V
CR1
CR2
C12 0.5μ
C13 0.5μ
C14 4.7μ
C15 4.7μ
C1 0.1μ
S5
OFF, -20dB, -40dB
R12
SHORT
R13
SHORT
BAL
R9 5K
R38 7.5K
R39 7.5K
IC1 (OP-05C)
C10 39p
C11 0.001μ
R11 100K
R10 20K
C3 3μ
C2 0.1μ
IC 2 (4558)
1/2
4 C5 0.01μ
C8 0.01μ
C9 0.01μ
R37 11K
R39 2K
13.5K
500F
R16 (RA005)
4P3F
VERNL
1 RIB 20K
RA 9.1K
SPAN
kΩ 2K
CW
C6 0.047μ
R20 21K
IC 2 (4558)
1/2
TB2
TB1
B10 OUT (0.2V/cm)
B9 TB2 (0.1V/cm)
B8 CAL V
B7
B6 +15V
B5 -15V
B4 O1
B3 O2
B2 GRD
B1 IN
L1
R23 20K
R22 68K
POSITION
to CHASSIS
R11
RESISTOR ARRAY (GT70)
2K 2K 6K 10K 20K 60K 100K 200K
0.01μ
C7
PCB PATTERN
JP
100/cm 50 20 10 5 2 1 0.5/cm
S4
RANGE
NOTE 2) R12, R13 : SHORT
NOTE 1) SYMBOL • 50ppm/°C

Pre Amplifier Type Z

Figure	Part No.	Description	Type	Remarks
PCB	511670018	Printed Circuit Board	4000-06A	
S1	508301001	Switch, Slide	J-S4036-01-W	
S2	508302012	" "	J-S5089-01-W	
S3	508301001	" "	J-S4036-01-W	
S4	507111108	Switch, Rotary	J-R2000	
S5	508304003	Switch, Slide	SSA043L06	
TB1	513400027	Test Terminal	LC-1-G	
TB2	"	" "	"	
IC1	503300007	IC, Op-Amp	Op-05E	
IC2	503300054	IC, Op-Amp, Dual	UPC4558C	
IC3	503300025	IC, Op-Amp	TA7504P	
CR1	503100035	Di, Zener, 6.5V	WZ-065	
CR2	"	" " "	"	
C1	502303006	C, Myler Film 0.1μ 50WV	MFL-05P1	
C2	502303007	C, " " 0.0047μ "	MFL-05D47	
C3	502403007	C, Ceramic 0.001μ "	ULD06-103-L2A	
C4	"	C, " " "	"	
C5	502303004	C, Myler Film 0.01μ "	MFL-05S1	
C6	502303005	C, " " 0.047μ "	MFL-05S47	
C7	502303003	C, " " 0.033μ "	MFL-05S33	
C8	502303004	C, " " 0.01μ "	MFL-05S1	
C9	"	C, " " " "	"	
C10	502403008	C, Ceramic 39P "	USD04SL390K-K2J	
C11	502303002	C, Myler Film 0.001μ "	MFL-05D1	
C12	502204003	C, Tantalum 3.3μ 16WV	CS151C3R3M1S-A	
C13	"	C, " " "	"	
C14	502204002	C, Tantalum 4.7μ "	CS151C4R7M1S-A	
C15	"	C, " " "	"	
R1	501503204	R, Metal Film 999K 1/4W ±0.1%	RN65E999KB	
R2	501502202	R, Metal Film 1K 1/8W "	RN60E1KB	
R3	501810420	R, " " 20K 1/4W ±1%	RN1/4-20KF	
R5	505103024	R, Trimmer, Cermet 50K	GF6X-5K	
R6	501443651	R, Metal Film 100K 1/4W ±1%	RP44C100KF	
R7	501502216	R, Metal Glaze 20M 1/8W ±10%	RH1/8HVS20MK	
R8	"	R, " " " " "	"	
R9	505101026	R, Trimmer, Cermet, Multi-Turn 5K	RJ20P-5K	
R10	501810430	R, Metal Film 30K 1/4W ±1%	RN1/4-30KF	
R11	501003307	R, Array ±0.1%	GT36	
R12	501443631	R, Metal Film 2K 1/4W ±1%	RP44C2KF	

Figure	Part No.	Description	Type	Remarks
R13	501443631	R, Metal Film 2K 1/4W ±1%	RP44C2KF	
R14	501810310	R, " " 1K " "	RN1/4-1KF	
R15	501810412	R, Metal Film 12K " "	RN1/4-12KF	
R16	501002809	R, Array	RA005	
R18	504105006	R, Variable, Cermet 20K	GFP161-20SB20K	
R19	501443608	R, Metal Film 9.1K 1/4W ±1%	RP44C9.1KF	
R20	501443609	R, " " 43K " "	RP44C43KF	
R21	505103009	R, Trimmer, Cermet 2K	GF6X-2K	
R22	501443614	R, Metal Film 20K 1/4W ±1%	RP44C20KF	
R23	504105007	R, Potentiometer, Multi-turn 20K	M1305-20K	
R24	501003309	R, Array 1.5K x 2 ±0.1%	RA940	
R25	501443614	R, Metal Film 20K 1/4W ±1%	RP44C20KF	
R27	501443602	R, " " 620 " "	RP44C620F	
R34	505103009	R, Trimmer, Cermet 2K	GF6X-2K	
R35	501810510	R, Metal Film 100K 1/4W ±1%	RN1/4-100KF	
	515100019	Knob ϕ10mm, Black	020-212	For R23
	516100016	" " " with Line	021-222	For S4
	516100017	Cap ϕ10mm, Black	040-102	For R23
	516100018	" " " with Line	040-162	For S4
R36	501503201	R, Metal Film 1M 1/4W ±0.1%	RN65E1MB	
R38	501443603	R, " " 7.5K " ±1%	RP44C7.5KF	
R39	"	R, " " " " "	"	
R40	501443631	R, " " 2K " "	RP44C2KF	
R41	"	R, " " " " "	"	
R42	501443614	R, " " 20K " "	RP44C20KF	

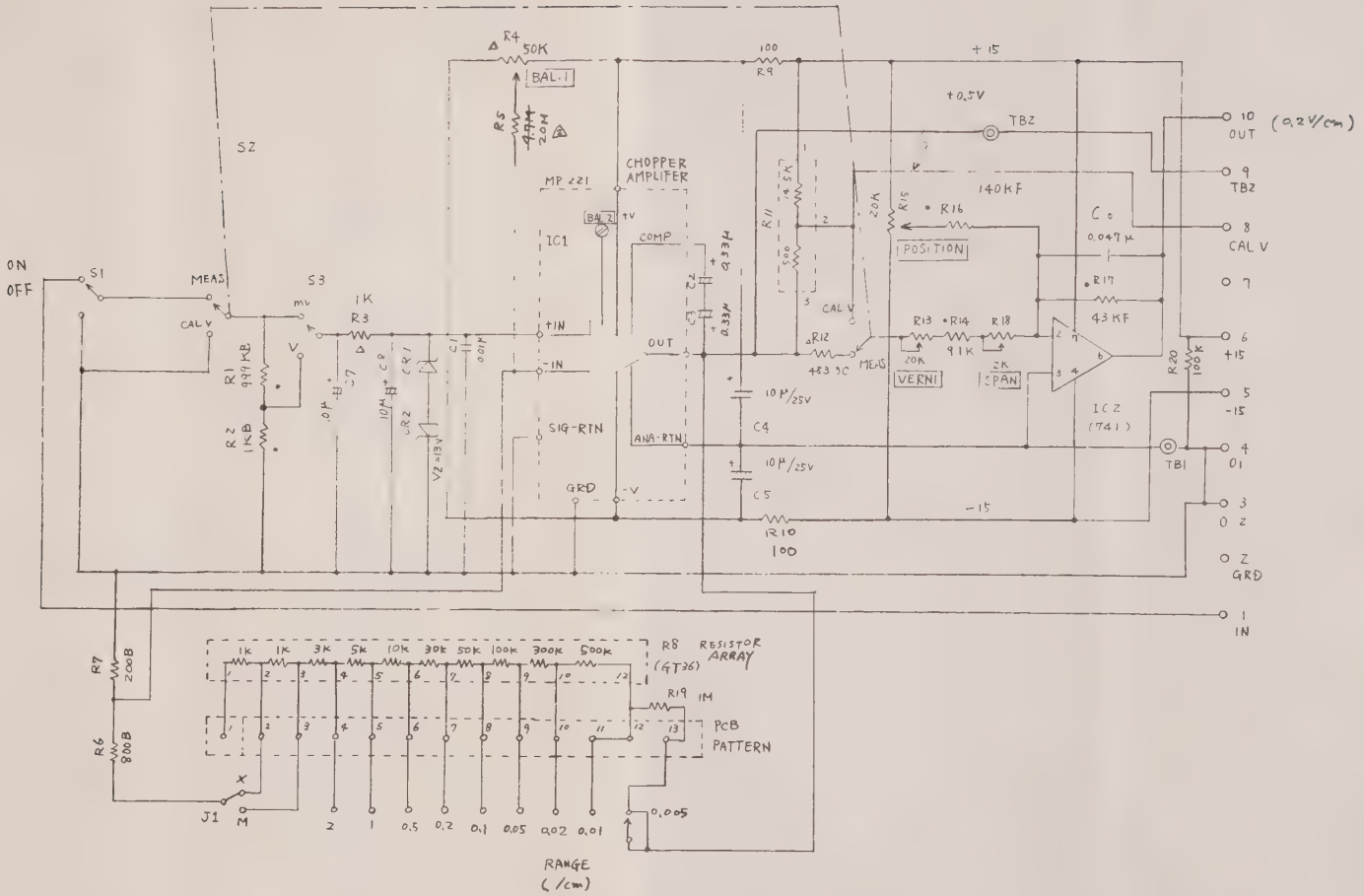

MEAS S1
OFF
S2 (MEAS)
S3
mV
V
(CAL.V)
R1 999kΩ
R2 1kΩ
R3 20K
R42 20K
CR1 6.5V
CR2 6.5V
R15 12K
C12 4.7μ
C13 3.3μ
C14 4.7μ
C15 4.7μ
S5
R5 50K
R6 100K
620Ω R27
R7 20M
R8 20M
R39 25K
R38 2.5K
R9 2K
BAL
C1 0.1μ
C2 4700P
R10 30K
R35 100K
C11 1000P
IC1 (OPL05E)
C10 39P
R40 2K
R12 2K
R41 2K
R13 2K
R14 1K
C3 0.01μ
C4 0.01μ
C8 0.01μ
C9 0.01μ
C5 0.01μ
IC2 1/2 (4558)
C8 0.01μ
R34 2K
CAL.V
13.51KΩ
500Ω
(CAL.V)
VERN
SPAN
483Ω (MEAS)
R16 (RA0005)
R18 30K
R19 9.1K
R21 2K
R20 43K
C6 0.047μ
IC2 1/2
TB2
TB1
B10 OUT (0.2V/cm)
B9 TB2
B8 CAL V
B7
B6 +15V
B5 -15V
B4 O1
B3 O2
B2 GRD
B1 IN
L1
to CHASSIS
R11 RESISTOR ARRAY
1K 1K 3K 5K 10K 30K 50K 100K 300K 500K
3300P C7
PCB PATTERN
1M R36
JP
20/cm 10 5 2 1 0.5 0.2 0.1 0.05
RANGE S4
R24 1.5K
R25 20K
R23 20K
R22 20K
1.5K
IC3 (741)
-15V

Pre Amplifier Type L

Figure	Part No.	Description	Type	Remarks
PCB	511400080	Printed Circuit Board	4000-06A	
S1	508301001	Switch, Slide	J-S4036-01-W	
S2	508302012	" "	J-S5089-01-W	
S3	508301001	" "	J-S4036-01-W	
S4	507111108	" Rotary	J-R2000	
S5	508304003	" Slide	SSA043L06	
TB1	513400027	Test Terminal	LC-1-G	
TB2	"	" "	"	
IC1	503300006	IC, Op-Amp	OP-05C	
IC2	503300054	IC, Op-Amp, Dual	UPC4558C	
CR1	503100035	Di, Zener, 6.5V	WZ-065	
CR2	"	" " "	"	
C1	502303006	C, Myler Film 0.01μ 50WV	MFL-05P1	
C3	502403007	C, Ceramic 0.001μ "	ULD06-103-L2A	
C4	"	C, " " "	"	
C5	502303004	C, Myler Film 0.01μ 50WV	MFL-05S1	
C6	502303005	C, " " 0.047μ "	MFL-05S47	
C7	502303004	C, " " 0.01μ "	MFL-05S1	
C8	"	C, " " " "	"	
C9	"	C, " " " "	"	
C10	502403008	C, Ceramic 39P "	USD04SL390K-K2J	
C11	502303002	C, Myler Film 0.001μ "	MFL-05D1	
C12	502204001	C, Tantalum 6.8μ 16WV	CS15E1C6R8M1S-A	
C13	"	C, " " "	"	
C14	502204002	C, " 4.7μ "	CS15E1C4R7M1S-A	
C15	"	C, " " "	"	
R1	501503202	R, Metal Film 990K 1/4W ±0.1%	RN65E990KB	
R2	501502204	R, " " 10K 1/8W "	RN60E10KB	
R3	501810410	R, " " 10K 1/4W ±1%	RN1/4-10KF	
R9	505101026	R, Trimmer, Cermet, Multi-Turn 5K	RJ20P-5K	
R10	501810420	R, Metal Film 20K 1/4W ±1%	RN1/4-20KF	
R11	501003320	R, Array ±0.2%	GT-70	
R14	501810310	R, " 1K " ±1%	RN1/4-1KF	
R15	505101026	R, Metal Film 12K " "	RN1/4-12KF	
R16	501002809	R, Array "	RA005	
R18	504105006	R, Variable, Cermet 20K	GFP161-20SB20K	
R19	501443608	R, Metal Film 9.1K 1/4W ±1%	RP44C9.1KF	
R20	501443516	R, " " 21K " "	RP44C21KF	
R21	505103009	R, Trimmer, Cermet 2K	GF6X-2K	
R22	501443613	R, Metal Film 68K 1/4W ±1%	RP44C68KF	
R23	504105007	R, Potentiometer, Multi-turn 20K	M1305-20K	
R34	505103009	R, Trimmer, Cermet 2K	RF6X-2K	
R35	501810510	R, Metal Film 100K 1/4W ±1%	RN1/4-100KF	

Figure	Part No.	Description	Type	Remarks
R37	501810411	R, Metal Film 11K 1/4W ±1%	RN1/4-11KF	
R38	501443603	R, " " 7.5K " "	RP44C7.5KF	
R39	"	R, " " " " "	"	
	516100019	Knob ϕ10mm, Black	020-212	For R23
	516100016	" " " with Line	021-222	For S4
	516100017	Cap ϕ10mm, Black	040-102	For R23
	516100018	" " " with Line	040-162	For S4

5.11 Preamplifier Type E



Pre Amplifier Type E

Figure	Part No.	Description	Type	Remarks
PCB	511661012	Printed Circuit Board	E-AMP-A	
IC1	503400006	IC, Chopper Amp	MP221	
IC2	503300025	IC, Op-Amp	TA7504P	
TB1	513400027	Test Terminal	LC-1-G	
TB2	〃	〃 〃	〃	
S1	508302012	Switch, Slide	J-S5089-01W	
S2	〃	〃 〃	J-S5089-01W	
S3	508301001	〃 〃	J-S4036-01W	
S4	507111108	〃 Rotary	J-R2000	
CR1	503100005	Di, Zener 13V 0.5W	WZ130	
CR2	〃	Di, 〃 〃 〃	〃	
C1	502403007	C, Ceramic 0.01μ 50WV	ULD06-103-L2A	
C2	502203025	C, 〃 0.33μ 35WV	CS15E1V0R33M	
C3	〃	C, 〃 〃 〃	〃	
C4	502203018	C, Tantalum 10μ 25WV	CS15E1E100M	
C5	〃	C, 〃 〃 〃	〃	
C6	502303005	C, Myler Film 0.047μ 50WV	MFL-05S47	
C7	502203018	C, Tantalum 10μ 25W	CS15E1E100M	
C8	〃	C, 〃 〃 〃	〃	
R1	501503204	R, Metal Film 999K 1/4W ±0.1%	RN65E990KB	
R2	501502202	R, 〃 〃 1K 1/8W 〃	RN60E1KB	
R3	501810310	R, 〃 〃 〃 1/4W ±1%	RN1/4-1KF	
R4	505101016	R, Trimmer, Cermet, Multi-turn 20K	RJ20P-50K	
R5	501502224	R, Metal Glaze 20M 1/8W ±10%	RH1/8HVD20MK	
R6	501502223	R, Metal Film 800 1/8W ±0.1%	RN60E800B	
R7	501502222	R, 〃 〃 200 〃 〃	RN60E200B	
R8	501003307	R, Array 〃	GT36	
R9	501810210	R, Metal Film 100 1/4W ±1%	RN1/4-100F	
R10	〃	R, 〃 〃 〃 〃 〃	〃	
R11	501003308	R, Array	RA939	
R12	501433303	R, Metal Film 483.3 1/4W ±0.25%	RP42A483.3C	
R13	504105006	R, Variable, Cermet 20K	GFP161-20SB20K	
R14	501443716	R, Metal Film 9.1K 1/4W ±5%	RP42C9.1KJ	
R15	504105007	R, Potentiometer, Multi-turn 20K	M1305-20K	
R16	501443717	R, Metal Film 240K 1/4W ±5%	RP42C240KJ	
R17	501443509	R, 〃 〃 43K 1/4W ±1%	RP42C43KF	
R18	505103009	R, Trimmer, Cermet 2K	GF6X-2K	
R19	501503201	R, Metal Film 1M 1/4W ±0.1%	RN65E1MB	
R20	501810510	R, 〃 〃 100K 〃 〃	RN1/4-100KF	
	516100019	Knob φ10mm, Black	020-212	For R15
	516100016	〃 〃 〃 with Line	021-222	For S4
	516100017	Cap φ10mm, Black	040-102	For R15

Figure	Part No.	Description	Type	Remarks
	516100018	Cap φ10mm, Black with Line	040-162	For S4
	516100011	" " "	PN7089-2	For S2

5.12 Chart Drive Wiring Diagram

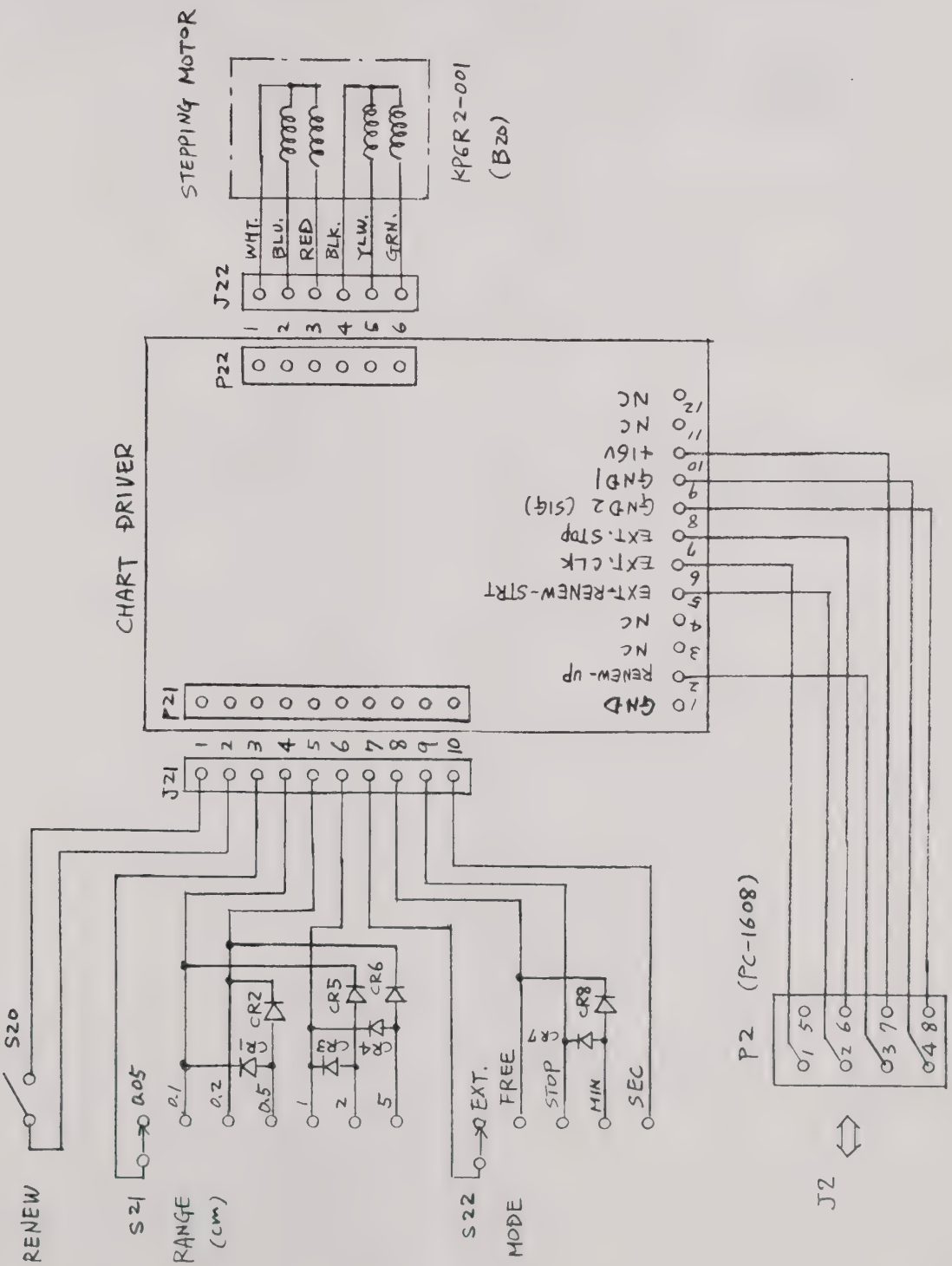
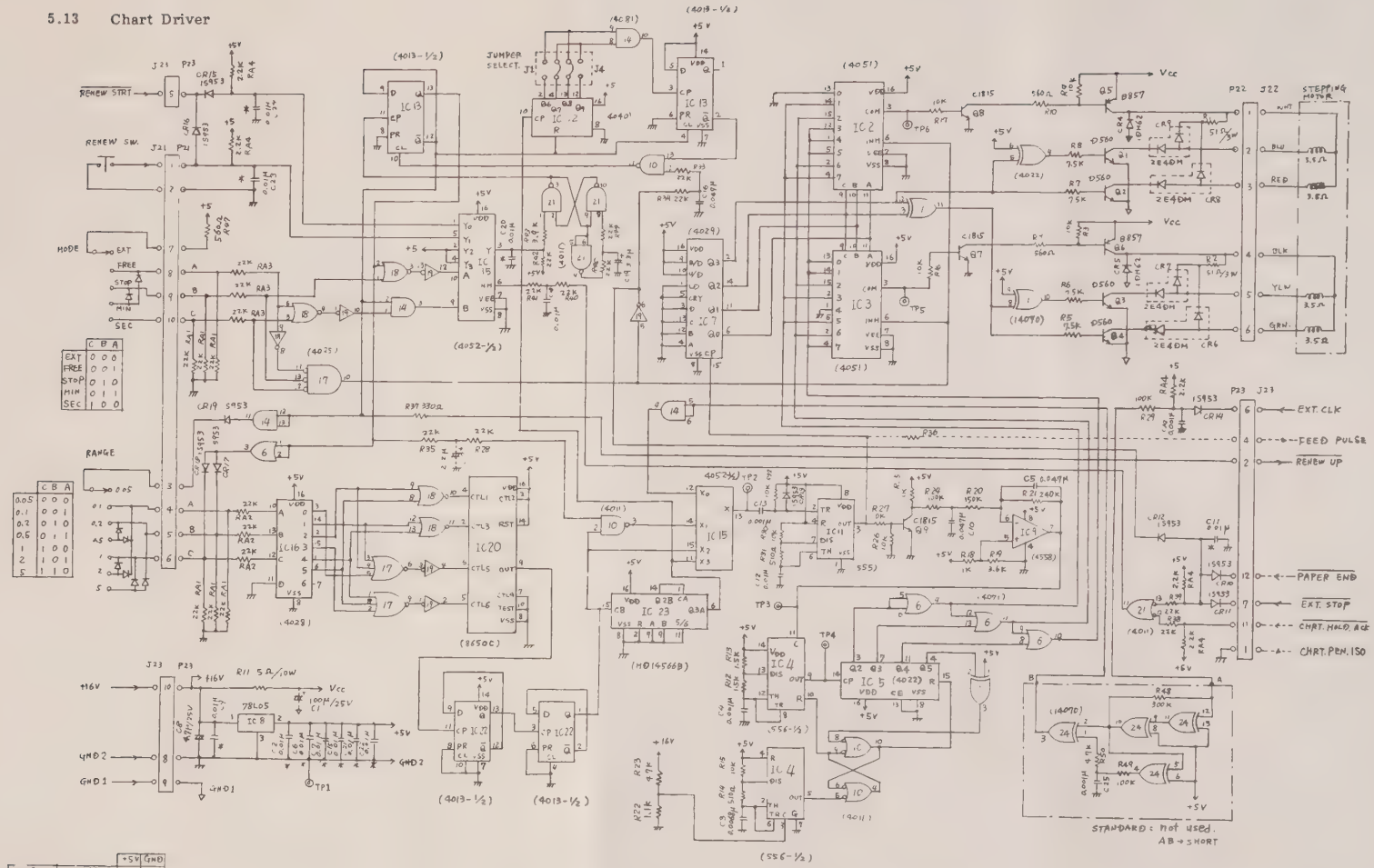


Chart Drive Wiring Diagram

Figure	Part No.	Description	Type	Remarks
B20	509400004	Stepping Motor	KP6R2-001	
S20	508201021	Switch, Push	1F-2U-0A	
S21	508204005	" , Rotary	M-117-15R-R	
S22	508204004	" "	SRM1025-15R-R	
CR1	503100020	Di, Si V_R = 30V I_F = 100mA	1S953	
CR2	"	Di, " " "	"	
CR3	"	Di, " " "	"	
CR4	"	Di, " " "	"	
CR5	"	Di, " " "	"	
CR6	"	Di, " " "	"	
CR7	"	Di, " " "	"	
CR8	"	Di, " " "	"	
J21	513400072	Connector Receptacle 10P	HNC2-2.5S-10	
CNP	513400037	Contact Pin	HNC2.5S-A	x 10 For J21
J22	513400036	Connector Receptacle 6P	HNC2-2.5S-6	
CNP	513400042	Contact Pin	HNC2.5S-B	x 6 For J22

5.13 Chart Driver



	+5V	GND
IC 19	TC4069UBP	14	7
IC 1, 24	HD 40708	14	7
IC 18	TC4001BP	14	7
IC 17	TC4025BP	14	7
IC 6	TC4071BP	14	7
IC 10, 21	TC4011BP	14	7
IC 14	TC4081BP	14	7

* CERAMIC

C1, C17, R36 : not used

Chart Driver

Figure	Part No.	Description	Type	Remarks
PCB	511240010	Printed Circuit Board	2400-10A	
IC1	503302078	IC, CMOS Quad EX-OR	HD14070B	
IC2	503300113	IC, " 8CH Multiplexer	TC4051BP	
IC3	"	IC, " " "	"	
IC4	503300035	IC, Dual Timer	NE556	
IC5	503300105	IC, CMOS Divide-By-8 Counter	TC4022BP	
IC6	503300106	IC, " Quad 2-Input OR	TC4071BP	
IC7	503300107	IC, " UP/Down Counter	TC4029BP	
IC8	503301064	IC, Voltage Regulator 5V	UPC78L05	
IC9	503300054	IC, Quad Op-Amp	UPC4558C	
IC10	503300062	IC, CMOS 2-Input NAND	TC4011BP	
IC11	503300030	IC, Single Timer	NE555	
IC12	503303348	IC, CMOS BCD to Decimal Divider	TC4028BP	
IC13	503300064	IC, " Dual D-Flip Flop	TC4013BP	
IC14	503303371	IC, " Quad 2-Input AND	TC4081UBP	
IC15	503303356	IC, " Dual 4CH Multiplexer	TC4052BP	
IC16	503303339	IC, " BCD to Decimal Divider	TC4028BP	
IC17	503303337	IC, " Triple 3-Input NOR	TC4025BP	
IC18	503300124	IC, " Quad 2-Input NOR	TC4001BP	
IC19	503303364	IC, " Hex Inverter	TC4069UBP	
IC20	503302076	IC, Programable Counter	TC8650-C	
IC21	503300062	IC, CMOS Quad 2-Input NAND	TC4011BP	
IC22	503300064	IC, " Dual D-Flip Flop	TC4013BP	
IC23	503302077	IC, " Divid-By-60 Counter	HD14566BP	
CR4	503100062	Di, Si	1DH62	
CR5	"	Di, "	"	
CR6	503100063	Di, " V_R = 200V I_F = 1.5A	2E4DM	
CR7	"	Di, " " "	"	
CR8	"	Di, " " "	"	
CR9	"	Di, " " "	"	
CR10	503100020	Di, " V_R = 30V I_F = 100mA	1S953	
CR11	"	Di, " " "	"	
CR12	"	Di, " " "	"	
CR13	"	Di, " " "	"	
CR14	"	Di, " " "	"	
CR15	"	Di, " " "	"	
CR16	"	Di, " " "	"	
CR17	"	Di, " " "	"	
CR18	"	Di, " " "	"	
CR19	"	Di, " " "	"	
Q1	503200028	Tr, NPN 5A 30W	2SD560	
Q2	"	Tr, " " "	"	
Q3	"	Tr, " " "	"	

Figure	Part No.	Description				Type	Remarks
Q4	503200028	Tr, NPN	5A	30W		2SD560	
Q5	503203021	Tr, PNP	−4A	40W		2SB857	
Q6	〃	Tr, 〃	〃	〃		〃	
Q7	503203014	Tr, NPN	100mA	200mW		2SC1815	
Q8	〃	Tr, 〃	〃	〃		〃	
Q9	〃	Tr, 〃	〃	〃		〃	
C2	502403007	C, Ceramic	0.01μ	50WV		ULD06-103-L2A	
C3	502303013	C, Myler Film	0.0068μ	〃		MFL-05D68	
C4	502303002	C, 〃 〃	0.001μ	〃		MFL-05D1	
C5	502303005	C, 〃 〃	0.047μ	〃		MFL-05S47	
C6	502403007	C, 〃 〃	0.001μ	〃		ULD06-103-L2A	
C7	〃	C, 〃 〃	〃	〃		〃	
C8	502103027	C, Electrolytic	4.7μ	25WV		SM25VB-4.7	
C10	502303005	C, Myler Film	0.047μ	50WV		MFL-05S47	
C11	502403007	C, Ceramic	0.01μ	〃		ULD06-103-L2A	
C12	502303004	C, Myler Film	0.01μ	〃		MFL-05S1	
C13	502303002	C, 〃 〃	0.001μ	〃		MFL-05D1	
C14	〃	C, 〃 〃	〃	〃		〃	
C15	502403007	C, Ceramic	0.01μ	〃		ULD06-103-L2A	
C16	502303005	C, Myler Film	0.047μ	〃		MFL-05S47	
C18	502303004	C, 〃 〃	0.01μ	〃		MFL-05S1	
C19	502203003	C, Tantalum	3.3μ	16WV		CS15E1C3R3M	
C20	502403007	C, Ceramic	0.01μ	50WV		ULD06-103-L2A	
C21	〃	C, 〃	〃	〃		〃	
C22	〃	C, 〃	〃	〃		〃	
C23	〃	C, 〃	〃	〃		〃	
C24	〃	C, 〃	〃	〃		〃	
RA1	501003322	R, Array	22K x 6			EXBP86-223M	
RA2	501003323	R, 〃	22K x 3			EXBT43-223M	
RA3	〃	R, 〃	〃			〃	
RA4	501002824	R, 〃	2.2K x 6			RM6-222	
R1	501609715	R, Wirewound	51Ω	3W	±5%	MU3P-51J	
R2	〃	R, 〃	〃	〃	〃	〃	
R3	501810410	R, Metal Film	10K	1/4W	±1%	RN1/4-10KF	
R4	〃	R, 〃 〃	〃	〃	〃	〃	
R5	501810375	R, 〃 〃	7.5K	〃	〃	RN1/4-7.5KF	
R6	〃	R, 〃 〃	〃	〃	〃	〃	
R7	〃	R, 〃 〃	〃	〃	〃	〃	
R8	〃	R, 〃 〃	〃	〃	〃	〃	
R9	501810256	R, 〃 〃	560Ω	〃	〃	RN1/4-560F	
R10	〃	R, 〃 〃	〃	〃	〃	〃	
R11	501609725	R, Wirewound	5Ω	10W	±5%	MU10P-5J	

Figure	Part No.	Description				Type	Remarks
R12	501810315	R, Metal Film	1.5K	1/4W	±1%	RN1/4-1.5KF	
R13	〃	R, 〃 〃	〃	〃	〃	〃	
R14	501810251	R, 〃 〃	510Ω	〃	〃	RN1/4-510F	
R15	501810410	R, 〃 〃	10K	〃	〃	RN1/4-10KF	
R16	〃	R, 〃 〃	〃	〃	〃	〃	
R17	〃	R, 〃 〃	〃	〃	〃	〃	
R18	501810310	R, 〃 〃	1K	〃	〃	RN1/4-1KF	
R19	501810336	R, 〃 〃	3.6K	〃	〃	RN1/4-3.6KF	
R20	501810515	R, 〃 〃	150K	〃	〃	RN1/4-150KF	
R21	501810524	R, 〃 〃	240K	〃	〃	RN1/4-240KF	
R22	501810311	R, 〃 〃	1.1K	〃	〃	RN1/4-1.1KF	
R23	501810347	R, 〃 〃	4.7K	〃	〃	RN1/4-4.7KF	
R24	501810510	R, 〃 〃	100K	〃	〃	RN1/4-100KF	
R25	501810310	R, 〃 〃	1K	〃	〃	RN1/4-1KF	
R26	501810410	R, 〃 〃	10K	〃	〃	RN1/4-10KF	
R27	〃	R, 〃 〃	〃	〃	〃	〃	
R28	501810422	R, 〃 〃	22K	〃	〃	RN1/4-22KF	
R29	501810510	R, 〃 〃	100K	〃	〃	RN1/4-100KF	
R30	501810410	R, 〃 〃	10K	〃	〃	RN1/4-10KF	
R31	501810251	R, 〃 〃	510Ω	〃	〃	RN1/4-510F	
R33	501810422	R, 〃 〃	22K	〃	〃	RN1/4-22KF	
R34	〃	R, 〃 〃	〃	〃	〃	〃	
R35	〃	R, 〃 〃	〃	〃	〃	〃	
R37	501810233	R, 〃 〃	330Ω	〃	〃	RN1/4-330F	
R38	501810422	R, 〃 〃	22K	〃	〃	RN1/4-22KF	
R39	〃	R, 〃 〃	〃	〃	〃	〃	
R40	〃	R, 〃 〃	〃	〃	〃	〃	
R41	〃	R, 〃 〃	〃	〃	〃	〃	
R42	〃	R, 〃 〃	〃	〃	〃	〃	
R43	501810339	R, 〃 〃	3.9K	〃	〃	RN1/4-3.9KF	
R44	501810422	R, 〃 〃	22K	〃	〃	RN1/4-22KF	
R45	〃	R, 〃 〃	〃	〃	〃	〃	
R47	501810256	R, 〃 〃	560Ω	〃	〃	RN1/4-560F	
TP1	513400027	Test Terminal				LC-1-G	
TP2	〃	〃 〃				〃	
TP3	〃	〃 〃				〃	
TP4	〃	〃 〃				〃	
TP5	〃	〃 〃				〃	
TP6	〃	〃 〃				〃	
P21	513400075	Connector	Pin Header	10P		HNC2-2.5P-10DS	

Figure	Part No.	Description	Type	Remarks
P22	513400062	Connector Pin Header 6P	HNC2-2.5P-6DS	
P23	513301011	" Plug 8P	PC-1608	
CNP	513201205	Contact Pin	PC-1600-111	x 7 For P23
	513201207	Connector Lock	1600-LC	x 2 For P23

6. SPECIFICATIONS

6.1 Recorder Specifications

	Model	WX2400-1 (1 Pen)	WX2400-2 (2 Pens)
Recorder	Recording area	A4 Size (250 x 180mm)	
	Recording paper holding method	Electrostatic attraction	
	Pen	Disposable fiber-tip pen	
	Circuit type	DC Servo	
	Input type	Floating ground with guard	
	Input resistance	1MΩ*	
	Allowable signal source resistance	10kΩ or less*	
	Accuracy	±0.25% of fullscale* (Including deadband)	
	Deadband	±0.1% of fullscale	
	Common mode rejection ratio	DC 150dB and AC 130dB or better at maximum sensitivity	
	Position adjustment	Pen position may be adjusted to any location within the fullscale range*	
	Sensitivity adjustment	2.5 times*	
	Maximum allowable input voltage	500VDC (including common-mode voltage)	
	Maximum pen speed	X=1.5m/s, Y_1=1.5m/s	X=0.8m/s, Y_1, Y_2=1.5m/s
		X=3G, Y_1=4G	X=2G, Y_1, Y_2=4G
	Pen lift response	10Hz	1Hz
	Pen busy time	20ms	300ms

	Model		WX2400-1 (1 Pen)	WX2400-2 (2 Pens)
Recorder	Time sweep		Refer to Section 6.2	
	Outer dimensions		482 x 310 x 124mm	
	Weight		10.5kg	11.5kg
	Power consumption		Balanced: 20VA	Balanced: 37VA
			Unbalanced: 105VA	Unbalanced: 130VA
	Operating environment		0 ∿ 45°C, 30 ∿ 85% (RH)	
	Power supply		100VAC ±10%, 50/60Hz, (or 115, 200, 220, 240VAC)	
etc.	Accessories		Refer to Table 8-3 (Instruction manual)	
	Option	Recording paper unit	Refer to Table 7-4 (Instruction manual)	
		Preamplifier	Refer to Section 6.3	
		Rack	Refer to Fig. 7-5 (Instruction manual)	

Note: Items marked "*" apply when the AZ2400 DC amplifier is installed as the preamplifier.

6.2 Time Sweep Specifications

Method	Precision analog voltage integration
Ranges	0.05, 0.1, 0.2, 0.5, 1, 2, cm/s (both X and Y axes)
Feed speed accuracy	±3% of fullscale
Linearity	±0.5%
Control operation	X/OFF/Y Switching, RESET/START

Item \ Model	AE2400 (H Type)	AZ2400 (Z Type)	AL2400 (L Type)
Maximum sensitivity	0.005mV/cm	0.05mV/cm	0.5mV/cm
Measurement range (including multiplier)	0.005, 0.01, 0.05, 0.1, 0.2, 0.5, 1, 2 (mV/cm & V/cm)	0.05, 0.1, 0.2, 0.5, 1, 2, 5, 10, 20 (mV/cm & V/cm)	0.5, 1, 2, 5, 10, 20, 50, 100 (mV/cm & x100mV/cm)
Switching accuracy (0.1V/cm reference range)	±0.25%		±0.45%
Input resistance	1MΩ fixed	1MΩ fixed	1MΩ fixed
Allowable signal source resistance	1kΩ or less	10kΩ or less	1kΩ or less
Sensitivity adjustment	Continuously adjustable between ranges		
Calibration voltage	Switched applied voltage is input corresponding to 10cm deflection		
Position adjustment	130% or greater of fullscale	-300% ∿ +300% of fullscale continuous adjustment	130% or greater of fullscale
Bias voltage			
Input filter characteristics		OFF: -3dB (typ), -20dB: -17dB or less, -40dB: -35dB or less (at 50Hz)	
Common mode rejection ratio	AC 130dB (50/60Hz), DC150dB	AC 140dB (50/60Hz), DC 150dB	AC (50/60Hz) 120dB DC (140dB)
Maximum allowable input voltage	500VDC (including common mode voltage)		

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